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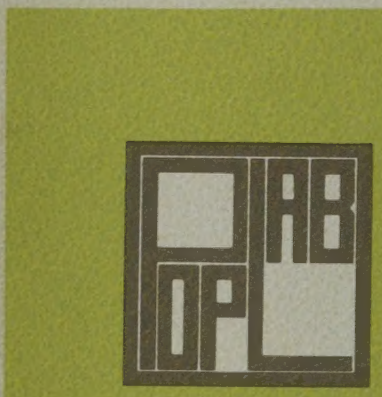
DESIGNING FORMS FOR DEMOGRAPHIC SURVEYS



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El Programa Internacional de los Laboratorios Estadísticos de la Población, se dedica a la investigación de mejores métodos para la medida de los cambios ocurridos en la población y al análisis de datos demográficos. Para este fin, el Programa espera establecer y mantener "laboratorios" experimentales en los cuales nueva metodología pueda ser comprobada y donde aplicable técnicas innovadas para et análisis de datos ya obtenidos puedan ser desarrolladas. Los proyectos se basan en acuerdos cooperativos entre la Universidad de Carolina del Norte, en Chapel Hill, é instituciones científicas de varios países. El Programa se lleva a cabo gracias a la participación de estas instituciones y a la asistencia de la Agencia para el Desarrollo Internacional del Gobierno de los Estados Unidos. Publicaciones científicas y técnicas son distribuídas, sin costo alguno, a un número limitado de instituciones y personas interesadas en problemas relacionados con medidas demográficas de la población. Las diferentes opiniones y conclusiones pertenecen a los autores respectivos, por lo que no deben ser atribuídas a las instituciones patrocinadoras.

Le Programme international des laboratoires statistiques de population s'adresse au perfectionnement des procédés qui mesurent les variations dans la population et à l'analyse des données démographiques. C'est avec ce but que le programme cherche à établir et à main enir des "laboratoires" experimentals où de nouvelles métodes démographiques peuvent être verifiées et où applicable, des voies innovatrices d'analyse des données existantes seront développées. Les projets sont basés sur des accords cooperatifs entre l'Université de la Caroline du Nord à Chapel Hill et des institutions scientifiques en divers pays. Ce programme se réalise grâce à la participation de ces institutions et l'assistance de l'Agence pour le Développement International du Gouvernement des Etats-Unis. Les publications scientifiques et techniques sont distribuées gratuitement aux institutions et aux individus qui traitent des problèmes démographiques. Les opinions et les conclusions exprimées sont celles des auteurs et non celles des institutions nommées ci-dessus.

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Laboratories for Population Statistics
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DESIGNING FORMS FOR DEMOGRAPHIC SURVEYS

Monroe G. Sirken

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Forrest E. Linder, Director

The Department of Biostatistics
School of Public Health

The Carolina Population Center

The University of North Carolina
Chapel Hill, N. C. 27514
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◄ à nos lecteurs

L'enquête statistique est un instrument de mesure complexe pour estimer la dimension et les caractéristiques d'une population. Elle nécessite plusieurs opérations différentes et chacune de celles-ci présente des problèmes techniques spécifiques. Ce manuel est consacré aux problèmes d'élaboration de questionnaires pour la collecte de données. Il fournit des indications pour la création des questionnaires se rapportant en particulier aux enquêtes sur le mouvement de la population faites auprès des ménages.

La manuel est divisé en deux parties. La première traite des procédés d'élaboration de questionnaires qui pourraient s'appliquer à tous les types d'enquêtes de ménage. Elle passe en revue les principaux "pré-requis" pour une élaboration de questionnaires réalisables et utiles, incluant, par exemple, la compréhension du rôle de celle-ci dans l'élaboration de l'ensemble de l'enquête. En plus, on y présente un procédé systématique de préparation des questionnaires. Selon ce procédé, on doit tout d'abord énoncer les exigences du questionnaire de base en termes d'information à recueillir et de stratégie d'enquête à choisir pour la collecte de l'information; deuxièmement, on doit faire apparaître la logique du questionnaire en arrangeant les rubriques d'information en sections et en les agençant à l'intérieur de ces sections; et enfin, on doit formuler des questions individuelles correspondant aux rubriques d'information déterminées.

Dans la deuxième partie du manuel, des questionnaires types sont élaborés dans le but de recueillir des éléments d'information particuliers, sur la population, les naissances et les décès, par une enquête rétrospective unique dans laquelle les ménages rapportent les événements démographiques, qui se sont produits durant une période antérieure. Ces questionnaires ne doivent pas être considérés comme des "modèles" mais des suggestions pour les enquêtes sur le mouvement de la population faite auprès des ménages. Ils sont présentés essentiellement pour illustrer la mise en oeuvre des procédés systématiques de préparation des questionnaires d'enquêtes. Toutefois, le développement étape par étape des questionnaires types peut servir, croit-on, de "modèle" au procédé d'elaboration des questionnaires sur le mouvement de la population faite auprès des ménages.

to our readers ▼

The statistical survey is a complex measuring instrument for estimating the size and characteristics of a population. It involves many different operations and each operation presents specific technical problems. This manual focuses on problems of designing data collection forms. It provides guidelines for designing survey forms with particular reference to household surveys of population change.

The manual is divided into two parts. The first discusses procedures for constructing forms which would apply to all types of household surveys. It reviews the major prerequisites for designing workable and useful survey forms including, for instance, an understanding of the role of form design in the overall survey design. Also, a systematic procedure is presented for preparing survey forms. The procedure specifies that, first, the basic form requirements must be formulated in terms of the information to be collected and the survey strategy selected for collecting the information; second, that

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a nuestros lectores ►

La encuesta, o estudio estadístico por muestreo, es un complejo instrumento de medición que permite estimar el tamaño y características de la población y que involucra diversas operaciones, cada una de las cuales presenta problemas técnicos específicos. Este manual enfoca el problema del diseño de formularios para la recolección de datos y proporciona algunas guias para el diseño de formularios con especial referencia a encuestas domiciliarias para la medición de cambios poblacionales.

Este manual esta dividido en dos partes. En la primera se discuten procedimientos para la construcción de formularios que pueden ser aplicados en todo tipo de encuestas domiciliarias. Aqui se revisan los prerequisitos más importantes para el diseño de formularios adecuados y útiles, incluyendo por ejemplo, la comprensión del rol del diseño del formulario dentro del diseño general del estudio. Se presenta además, un procedimiento sistemático para la preparación de formularios para encuestas. El procedimiento especifica que, en primer término, se deben establecer los requisitos que debe cumplir el formulario en términos de la información que se recolectará y del tipo de encuesta seleccionado para recolectar la información; en segundo término, se debe organizar el formulario en forma lógica dividiendo los tópicos en secciones y ordenándolos dentro de cada sección, y por último, se deben preparar preguntas específicas que correspondan a los tópicos de información requeridos.

En la segunda parte manual se construyen formularios tipo para la recolección de información sobre población y sobre nacimientos y muertes a traves de una única encuesta retrospectiva, en la que se recoge en cada domicilio información sobre los acontecimientos vitales que ocurrieron en un período especificado. Estos formularios tipo se sugieren como ejemplo y no deben ser tomados como "modelos" de encuesta domiciliaria para medir cambios poblacionales. La intención al presentarlos ha sido ilustrar la implementación de procedimientos sistemáticos para la preparación de formularios para encuestas. Creemos sin embargo, que el desarrollo "paso a paso" de los formularios tipo puede servir como "modelo" del procedimiento de diseño de formularios aplicado a encuestas domiciliarias para la medición de cambios poblacionales.

the logic of the form must be charted by arranging the items of information into sections and ordering them within sections; and finally, individual questions must be constructed corresponding to specific information items.

In the second part of the manual, specimen forms are constructed to collect selected items of information about the population and about births and deaths by a single retrospective survey in which households report the vital events that occurred during a prior calendar period. These forms are suggestive and are not intended to serve as "models" for household surveys of population change. They are presented primarily to illustrate the implementation of systematic procedures for preparing survey forms. It is believed, however, that the step-by-step development of the specimen forms may serve as a "model" of the procedure for designing forms applied to household surveys of population change.

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Designing Forms for Demographic Surveys

Monroe G. Sirken

I. Introduction — Purpose and Scope

I.1 Objectives

The statistical survey is a complex measuring instrument for estimating the size and characteristics of a population. It involves many different operations including sampling, interviewing, form design, computer programming, and statistical analyses. Each survey operation presents special technical problems. This manual focuses on problems of designing data collection forms. Its primary objective is to provide guidelines for designing data collection forms with particular reference to household surveys of population change using illustrative forms to show the principles involved.

I.2 Statement of the Problem

The vital statistics available for most countries, even the industrial nations, do not meet the needs for these data. The problem, however, is particularly serious in developing countries since few of them have now or are likely to have in the near future sufficiently complete national systems for registration of births and deaths to estimate annual rates of natural increase. Since national estimates of population change are urgently needed in developing countries to plan national economic policy and to evaluate the impact of population programs on population growth, improved methods of designing surveys to estimate population growth are being improvised and tested.

Essentially three types of data collection methods involving sample surveys are being investigated: (1) single retrospective surveys, (2) periodic household surveys, and (3) dual report surveys. The simplest of these is the single retrospective survey which involves a single visit to a sample of households. Households report retrospectively the births and deaths that occurred in a specified reference period that preceded the survey. In the periodic household survey, visits are made periodically to the same sample households. Households report changes in their composition during the intervening period and the reasons for these changes. The dual report survey involves two independent data collection methods: (a) the periodic household survey described above, and (b) a continuous system for recording vital events. By matching the lists of vital events reported in the survey and collected by the recorders, the dual report system is able to count events reported by either the survey or the recorders and to correct for the events that are missed by both.

Since it is not the purpose of this manual to discuss the advantages and disadvantages of alternative data collection systems for producing estimates of population change, the reader may wish to refer to recent papers on these systems [see page 46]. The specimen forms developed in this manual refer specifically to single retrospective surveys. However, it should not be difficult to adapt them to meet the requirements of a periodic survey whether conducted singly or as one of the two parts of the dual report system.

Although the specimen forms presented in this manual may be suggestive, it was not intended that they would serve as "model" forms for household surveys of population change. It is doubtful that the items of information contained on the specimen form would adequately serve the needs of most surveys

MONROE G. SIRKEN, PhD, is Director of the Office of Statistical Methods at the National Center for Health Statistics in Rockville, Maryland.

of population change since a minimum number of items are included. Furthermore, the specimen forms do not qualify as "model" forms because they have not been tested under a broad range of different conditions.

Specimen forms are prepared and presented in the manual primarily to illustrate procedures for designing such survey forms. It is hoped that the development of these forms may serve as "models" of the *process* for developing forms for surveys of population change — a process that includes defining the data requirements before starting to draft the survey forms, and conducting pretests of the drafted survey forms before using them in the actual survey.

At the present, we are more secure in our understanding of the procedures for developing forms than in our knowledge of the principles of form design. In general, the procedures advise us to proceed with caution because the basic principles are so elusive. It is noteworthy that unanimity of opinion probably does not exist with respect to some of the advice presented in this manual on wording and ordering of questions on the form. The statistical evidence is often lacking or contradictory. Relatively few rigorous methodological studies have been conducted because of the basic difficulty of designing and implementing these kinds of survey experiments. On the other hand, inadequate conceptualization is probably responsible at least in part for the apparent inapplicability of the experimental results from one population to another.

I.3 Organization

The manual is essentially divided into two major parts. Procedures for constructing forms are basically the same for all types of surveys. These matters are presented in Chapters 2 and 3. Chapter 2 reviews some of the basic factors relating to the design of the survey form while a process for designing the form itself is presented in Chapter 3. This process is applied in Chapters 4 and 5 in constructing illustrative forms for surveys of population change based on single retrospective surveys. The forms to collect information about births and infant deaths are developed in Chapter 4 and the forms to collect information about non-infant deaths are developed in Chapter 5.

II. Factors Related to Form Design

In this part of the manual, some of the prerequisites for designing workable and useful forms for surveys are briefly reviewed. One of these prerequisites is an understanding and appreciation of the role of form design in the overall design of the survey. Another prerequisite is an understanding of some principles relating to the design of the questions for the survey form. Also, it is imperative to recognize the need (1) to test forms prior to using them in a survey, (2) to evaluate the performance of forms used in a survey, and (3) to conduct controlled experiments to determine the effect of alternative form designs.

II.1 Survey Design

The statistical survey is conducted to estimate the size and characteristics of a particular population. Before attempting to design the survey it is essential to specify the purpose and objectives of the survey, and the major features of the overall survey plan should be decided before work is begun on the design of survey forms. Attention is directed to this ordering of work because there is often a temptation to create the questionnaire before the objectives and overall plan of the survey have been adequately defined.

The objectives of the survey are often referred to as the survey requirements. They specify (1) the data requirements — that is, the identity of the population to be surveyed and the characteristics to be estimated and (2) the precision requirements — that is, the level of accuracy needed in the survey estimates. The survey requirements may also specify how quickly the estimates are to be produced.

II.11 *Data requirements* The United Nations classifies population characteristics into two types: (a) demographic status characteristics such as size, spatial distribution and composition of the population and (b) dynamics of the population which are based on measures of fertility, mortality, migration, etc. The survey requirements specify the estimates to be produced by the survey in terms of both types of population characteristics.

The data requirements vary from survey to survey although it would be hard to imagine

that the requirements of a survey of population change would not include death rates by geographic location and age and sex and birth rates by geographic location and age of mother. In addition to defining the population to be covered by the survey, the data requirements should identify the subdivisions of the population for which separate estimates of birth and death rates are needed. If estimates are needed by the other measures of population change, such as migration, marriage or divorce, these requirements should be specified also.

II.12 *Precision requirements* Statistics based on household surveys are subject to many kinds of errors. The statistics are subject to sampling errors if the survey is based on a sample of households rather than on a complete enumeration of all households in the population. Survey statistics are always subject to nonsampling errors, which are introduced in the process of conducting the survey whether the survey is based on a sample or covers all households.

Most household surveys of population growth are based on multistage sample designs because it is generally not economical to conduct an interview survey in which the sample households are widely dispersed. Assuming a two-stage sample design, a sample of geographic areas is selected in the first sampling stage and in the second stage a subsample of housing units is selected within the sample areas. Clearly, sampling errors decrease as the number of areas and housing units selected in the sample increase.

Nonsampling error, also referred to as measurement error, is not as simple a concept as sampling error. By nonsampling error we mean the sum of the errors that are made in the process of survey measurement. It will help to explain this concept if we briefly review the processes by which the household survey measures the characteristics of the population. The process of survey measurement involves the following major operations:

(a) compiling the sampling frame and selecting the sample housing units
(b) constructing the survey forms
(c) collecting information from sample households
(d) processing the sample data

Some of the kinds of measurement error which are connected with each of these operations are discussed below:

Sampling

The sampling frame lists (1) all the first-stage areas and (2) all housing units in the selected first-stage sample areas. The procedures for compiling the sample frame and selecting the sample of housing units produce measurement errors whenever some dwelling units do not have a chance of being selected in the sample or whenever the probabilities for selecting housing units are unknown.

Form Design

Survey forms contain the items of information that are collected in the survey. In general, the forms are a source of measurement error to the extent that the questions do not produce the information specified by the survey data requirements. This would occur if the questions asked for the wrong information or if the questions were unanswered, or answered incompletely or inaccurately. A major objective of this manual is to understand the reasons why survey forms produce incomplete or inaccurate responses so that the difficulties can be avoided in designing the forms. Some of the reasons for measurement error resulting from poor question design are:

(a) The form asks for information that the respondent doesn't have or doesn't want to report.
(b) The questions are poorly constructed or incorrectly worded.
(c) The response categories to the questions are incomplete or ambiguous.

Data Collection and Processing

Estimates based on household surveys of population change are virtually always subject to measurement errors in the data collection operations because the survey is rarely successful in collecting information from all the sample households. Measurement error due either to the fact that the household was not contacted or that it refused is called nonresponse error. If the information is collected by means of personal interviews, the survey

estimates would also be subject to response errors if the interviewer influenced responses either by his manner of asking questions or his way of recording the answers.

Measurement errors in data processing include errors that are made in the process of editing, coding, card punching, and tabulating the survey data.

II.13 *Efficiency* The magnitude of measurement errors depends largely on the specific procedures that are used in conducting the survey. To varying degrees, each of the different types of measurement error can be controlled by improving the survey procedures. For example,

(a) Omissions in the sampling frame may be reduced by conducting a more thorough listing of housing units in the selected sample areas.
(b) Errors in responding to the survey questions can sometimes be reduced by adding "probing" questions and thereby lengthening the survey form.
(c) Nonresponse is reduced by increasing the number of call-backs to households that are not-at-home.
(d) Coding errors may be reduced by increasing the proportion of records that are verified.

One object in designing a statistical survey is to make the survey as efficient as possible. The efficiency of the survey design is measured in terms of two factors, (a) the cost of conducting the survey and (b) the accuracy of the survey estimates of the population characteristics. The survey is designed either to maximize the accuracy of the survey estimates for fixed costs or to minimize the costs of conducting the survey for fixed accuracy.

If the survey requirements are unrealistic it would not be feasible to design a satisfactory survey. This would occur if the accuracy requirements of the survey exceeded the maximum accuracy attainable or if the available money was less than the minimum cost of conducting the survey. To make a survey feasible it is sometimes necessary to make compromises in the survey requirements. This could be done by limiting the scope of the data requirements or by reducing the level of the accuracy requirements.

The interdependence of the form design, the sample design and the design of the other survey operations in the overall design of the survey should be emphasized. Although there is no guarantee that an unlimited budget will assure a specified level of accuracy, the budget of the survey ultimately controls the level of sampling error and measurement errors in the survey estimates. The overall survey design would be inefficient if either too large or too small a fraction of the budget was devoted to either the sample size, the length of the interview, the number of call-backs, etc. It would be inefficient, for example, to design a lengthy survey form that collects nonessential information at the expense of taking a smaller sample or of making fewer call-backs on not-at-home households.

The interplay between errors and costs and between different kinds of errors is illustrated below by two features of the survey design: type of respondent rule and length of the reference period.

Respondent rules define the household residents who are eligible to respond in the survey. The field cost of collecting the information is less if the rule states that "any adult in the household may report for himself as well as for other adults who live in the same household" rather than "each adult is eligible to report for himself only." However, for most person items, the quality of information reported on the survey form is better if each person reports for himself.

Length of reference period refers to a specified calendar period for which respondents are asked to report vital events. Increasing the reference period increases the cost of the survey. In surveys of population change it is usually a one year calendar period just prior to the survey. Sampling errors of the survey estimates of births and deaths decrease with increases in the length of the reference period but nonsampling errors due to underreporting of events increase with increases in the length of the period.

II.2 Question Design

Questions are the elementary units used in the construction of survey forms. Consequently, designing efficient questions is a requirement for designing efficient survey forms. This section of the manual presents some guidelines for constructing the questions for the survey form.

How the quality and costs of the statistics collected in the survey are affected by the content and structure of the questions contained on the survey form will be described next. Content refers to the kind of information that the question asks for and structure refers to the wording of the question.

II.21 *Content* Three criteria may be used to evaluate the content of a question: (1) the relevance of the information to the objectives of the survey, (2) the willingness of the respondent to cooperate by answering the question, and (3) the likelihood that the respondent knows the answer to the question.

Relevance

The function of a question is to obtain an item of information. Every question contained on the survey form should be justified on the basis of its relevance to the data requirements of the survey. Questions that do not serve the objectives of the survey should be excluded. For instance if the sole object of the survey is to estimate the growth of the population during the past year, it would be relevant to ask questions on births and deaths that occurred last year. It would not be relevant to ask questions on family planning attitudes. The survey resources that are saved by eliminating questions that are not relevant can be used to increase the sample size and to improve other survey operations and thereby reduce the size of the sampling and nonsampling errors. This savings in cost comes primarily through a reduction in cost of analysis and report writing which results from the elimination of questions.

Sometimes a question is relevant to the survey objectives but its relevance is not apparent to the respondent. For example, in a household survey of population growth, the household that occupies a sample dwelling unit is sometimes asked about households that formerly occupied the dwelling unit. The respondent might be more willing to cooperate, if he was told that it was necessary to inquire about former residents because all deaths that occurred in that housing unit during the past year are counted in the survey in order to assure that no deaths are missed.

Sensitivity

The sensitivity of a question is what most affects the willingness of the respondent to respond. There are wide differences among different societies in what would be considered a sensitive question. For example, in some societies, household respondents would be reluctant to answer questions about deaths in the household. The recent death of a young infant would not be reported for fear it would bring bad luck or shame at having lost the child. In other places, respondents would be reluctant to report the birth of an illegitimate child because of the stigma society attaches to illegitimacy. The latter problem is often sidestepped in household surveys of population change by revising the data requirements and asking fertility questions only for females who were ever-married.

Respondents would want to conceal certain facts if they had any doubt about the uses to be made of such information. For example, respondents would wish to conceal their financial status if they thought that the information might be made available to the income tax authorities, and they might not report abortions that were performed without legal sanction for fear that the information would be accessible to the police.

The respondent's reluctance to answer sensitive questions can sometimes be overcome by providing him with assurances of confidentiality or by assuring the anonymity of his replies. For example, the forms used in household surveys conducted by many statistical agencies explicitly state that the confidentiality of the information will be respected and that the information will be used for statistical purposes only. A sense of anonymity may be given the respondent by having him complete a self-enumeration form which he returns unsigned directly to the survey office or by having him deposit the form in a ballot box. Recently, an interesting interviewing technique

was developed to assure anonymity of response. The technique is called "randomized response" because the respondent selects a question on a random basis from two or more questions and he answers the question, without revealing to the interviewer which one was selected. Neither of these procedures for assuring anonymity could be used, however where the respondents are unable to read.

Knowledge and Recall

Questions should not ask about matters that are outside the information range of household respondents, or that require the respondent to have expert technical knowledge. For example, virtually all household respondents would be poor sources of information to report the medical diagnoses of their illnesses even if they had received medical care.

Whether or not the respondent is ignorant of the facts sometimes depends as much on which person in the household answers the question as it does on the content of the question. For instance we might conjecture that the male head of the household is a more likely source for information on the family's medical expenses and his wife a better source for information on food expenditures.

We call attention to the difference between questions that ask about status characteristics of individuals such as age, sex, and marital status, and those that ask about vital events that occurred during the reference period. The latter question depends not only on the respondent knowing that the events occurred but also on the respondent's ability to remember the events well enough to correctly place them in time. These questions present the respondent with two recall problems: (1) whether or not an event occurred and, (2) whether or not the event occurred during the reference period. The tendency of respondents to erroneously shift events into or out of the reporting period is called telescoping.

The net underreporting of the number of events tends to increase as the length of the reference period increases. In a study conducted by the Indian National Sample Survey, the annual birth rate estimated on a one-year reference period was 34 per 1000 and the estimate based on a three-month reference period was 42 per 1000, a rate believed to be closer to the actual rate in India. The results of a methodological study of the optimum recall period for reporting motor vehicle accidental injuries conducted by the U. S. National Health Survey indicated that the net underreporting was 25%, 21%, and 13% based on reference periods of 12 months, 6 months, and 3 months respectively.

It is believed that self-repondents are better than proxy respondents in reporting retrospective information. For instance, the methodological study of optimum recall for reporting motor vehicle injuries showed that 10% of self-respondents and 20% of proxy respondents did not report the accident. In household surveys of population change, the fertility questions are frequently asked separately for each adult woman of childbearing age, particularly if lifetime fertility histories are requested.

Supplementary questions are frequently asked on the survey form to jog the memory of the respondent. If the question serves this purpose it is called a "probing" question. For instance, a question on deaths that occurred in the household might be supplemented by a probing question on infant deaths that occurred in the household since infant deaths tend to be overlooked by the household respondent.

The difficulties that the respondent has in locating events within the reference period can sometimes be lessened if the period corresponds to one that is important to the population being studied, for instance, a 12-month calendar period corresponding to agricultural calendar points or religious festivals, or if the reference period is bounded by conducting interviews at the beginning as well as at the end of the period. Another technique for controlling errors due to telescoping is used by the U. S. National Health Survey. Questions ask for hospital admissions during a 12-month reference period but the survey estimates of hospital utilization are based on admissions that occurred within the most recent six month period only.

II.22 *Structure* There are essentially two parts to the structure of a question. The part that asks for information, we will call the subject of the question. The part that records the response, we will call the predicate of the question. For

instance "When did your household move into this housing unit?" is the subject, and the predicate of the question is "year _____ month _____."

Subject of the Question

A question is referred to as "structured" or "unstructured" depending on how completely and formally the subject of the question is stated on the survey form. A structured question is a complete statement that is written on the survey form exactly as it is meant to be asked. For example, the question quoted in the preceding paragraph is a structured question. The subject of an unstructured question is an incomplete or abbreviated statement such as a phrase or a table heading. The unstructured question is not standardized since it is expanded at the discretion of the interviewer to make its meaning understood.

The form used in a household interview survey to collect factual information usually contains structured questions in which the interviewer asks the questions exactly as they are worded. It is believed that responses to questions standardized in this manner would tend to be more comparable particularly if the interviewers are relatively inexperienced. Standardization of question wording is especially important if part of the population speaks a different language from the rest. Where possible the forms should contain a structured version of the question in each language rather than depend on the interviewers to translate the questions from one language into the other. Special care should be taken to preserve the meaning in translating a question from one language to another. One technique for doing this involves retranslating the question into the original language and comparing it with the original question.

Sometimes the interviewer is permitted to explain the intent of the question in his own words if it is still not clear to the respondent after the exact wording of the question was repeated. Generally, this procedure would be recommended only if the interviewers have been carefully trained and were given manuals which describe the intent of each question.

Although a short question may not always be preferable to a long question, it is generally believed that a question that is simple and short is usually more comprehendible to the respondent than a compound question that asks for several items of information. For example, several items of information are requested by the following question:

> "How many deaths occurred among members normally resident in this household during the past year and what was the age and sex of each person who died?"

The question could easily be restructured into at least two separate questions — one that asked about the number of deaths, and the other question would be asked to determine the age and sex of each person who died if any deaths were reported in response to the first question.

A well structured question is comprehendible — the words transmit the intent of the question to the respondent. Consequently, the wording of a "good" question is dictated by the customs of the respondents. For instance, the phraseology of a question that asks about "deaths among members normally resident in this household," would probably not be appropriate in a polygamous society where parts of the same household were housed in separate housing units. The wording of the question should reflect the literacy and educational status of the respondents. Since survey forms are usually designed by persons with higher than average education, there is always the danger that the questions will be stilted and too erudite for most respondents. The questions should specify precisely the information that is wanted. Words like "young people" and "usually" have indefinite reference points and are apt to be assigned different meanings by different respondents. For instance, the intent of a question that asks about deaths during the past year is not clear since it does not specify whether the period refers to the 12 month period immediately prior to the interview, to the preceding calendar year, etc.

The wording of a "good" question is usually neutral — the wording does not dispose or lead the respondent to give one answer rather than another. For example, a question that asks "How many deaths occurred during the past year?" is biased since it anticipates that one or more deaths will be reported when in actu-

ality death is an uncommon event and deaths would have occurred in only a fraction of the households. The biased wording of this question might lead the respondent to report deaths that occurred more than a year ago. To make the wording neutral would probably require asking first whether or not any deaths had occurred. Sometimes biased questions are deliberately constructed to overcome the reluctance of the respondent to provide the information. In most instances it would be preferable to use a probing question for this purpose. For instance, after asking if any deaths occurred, additional questions might ask specifically about infants and older persons since experience indicates that these deaths are less likely to be reported. In the following illustration, four probing questions are asked to obtain a count of all the births that a woman ever had:

How many live births did you ever have? _____
Did you include

Your most recent baby?	☐ Yes	☐ No
All children living with you?	☐ Yes	☐ No
All children who live someplace else?	☐ Yes	☐ No
Infants who died?	☐ Yes	☐ No

Predicate of the Question

A question is referred to as "open" or "closed" depending on the length and structure of the response. The open question produces an unstructured type of response that is recorded on the form in the respondent's own words. The closed question produces a brief structured response. It channels the response to a relatively small number of answer-choices that are usually printed on the form. Listed below are two questions that have been asked in household surveys of knowledge and attitude toward family planning.

Are there any important disadvantages to having only two children?

☐ Yes ☐ No

↓

If "Yes"
What are they? _____

The first is a closed question and the second is an open question. If it were possible to list a relatively small number of all possible answer-choices to the second question, it would become a closed question.

The question that limits the response to one of two answer-choices such as "yes" or "no" is the simplest type of closed question. The closed question may have three or more answer choices but rarely will it have more than ten answer choices. If the answer choices are not obvious they are read aloud by the interviewer or they are listed on a card, referred to as a flash card, which the interviewer hands to the respondent. The flash card can be used among respondents who can read whenever there are more than three answer choices on the theory that the respondent would have difficulty keeping in mind more than three choices. It might also be possible to use picture cards among illiterates. The answer choices to a closed question should be exhaustive; that is, the answer choices should be able to handle every possible reply to the question. This implies that the answer choice "don't know" or "no response" would be listed as answer choices to a closed question whenever appropriate. The answer choices should be mutually exclusive.

Generally, a household survey form contains both open and closed questions since the two kinds of questions are used under different conditions and for different reasons.

The open question is often used in surveys of attitudes and opinions because an unlimited range of responses is wanted. For the same reason, the open question is frequently used in the early stages of developing a question before the answer choices can be specified with confidence. Whenever all possible answer choices to a question cannot be easily specified, the open question is the only alternative. For instance, it would be virtually impossible to specify a detailed listing of diagnosed medical conditions or of occupational categories in a relatively small number of answer choices. Sometimes an open question will list a small number of answer choices and provide space on the form to record the responses that are not covered by the answer choices. For instance in addition to income from wages and salary and self-employment, there are many sources of "other" income. A question on sources of other income could be structured as follows:

During the past 12 months, did you have any other sources of income such as these listed on this card?

- ☐ Interest and dividends
- ☐ Rent from a house or farm
- ☐ Government pension
- ☐ Regular contributions from a relative
- ☐ Other (specify) _____

If the answer-choice "other" were checked, the enumerator would record the type of other income reported by the respondent.

The responses to a closed question are standardized in the sense that all respondents have considered exactly the same answer choices. This is one of the principal reasons for using the closed question, particularly in collecting factual information from household respondents. If the answer choices are read aloud by the interviewer or listed on a flash card, they serve as probes helping the respondent to remember. For instance, presenting the respondents with a list of other sources of income may help him to recall receiving income from some of these sources.

There are obvious advantages in using closed questions from the viewpoint of the efficiency of data collection and data processing. Usually the answer choices to the closed question are precoded whereas the coding of responses to open questions can be a formidable and expensive procedure. The closed question is less time consuming and demanding for the interviewer. It takes less time and effort to check answer choices than to record the replies in the respondent's own words. The overall length of the interview is frequently reduced by using the answer categories as a basis for not asking subsequent questions which would not be relevant. For instance, each of the three answer choices to the following question results in a different question being asked next.

21. When did your household move into this housing unit?
    - ☐ Before 1970? → ASK ITEM 22
    - ☐ During 1970? → SKIP TO ITEM 24
    - ☐ After 1970? → SKIP TO ITEM 26

A question of this type is called a "filter" question. Question marks after the response categories indicate that the categories are read aloud by interviewers. They are read aloud in this question in order to funnel the diversity of possible answers to the broad choices of acceptable response categories.

II.3 Control and Review Procedures

Every survey should have (1) quality control procedures for detecting and correcting errors as they occur in various stages of the survey operations and (2) technical review procedures for detecting and evaluating errors that, despite quality controls, may exist in the statistics based on the survey. In this part of the manual we discuss quality control and technical review procedures for detecting, correcting and evaluating errors in the survey measurement process due to the form design.

II.31 *Quality Control* Pretests are quality control procedures for detecting and correcting errors in the process of designing the survey form. After the initial draft of the form has been developed according to the guidelines that will be presented in the next chapter, the forms should be pretested and revised as necessary before a final version is prepared for the pilot study. The pilot study is a dress rehearsal of all the survey operations and is conducted before embarking on the survey itself. Since it is generally impossible to make changes in the forms after the regular survey is underway, it is essential to conduct thorough pretests.

Pretests are field trials of the forms to make sure that the respondents grasp the meaning of and can and will answer the questions. The number of pretests that would be required to develop an acceptable form varies from survey to survey and depends on a number of factors including the experience of the persons designing the form and the complexity of the form. Also, designing a completely new form would generally require more pretesting than adopting or adapting a form which has been used successfully before. However, even if "model" forms are available, it is essential to pretest and adapt them to the particular conditions of the survey. Pretests also serve other purposes such as giving estimates of the time required to collect data.

The sample of households in the pretest need not be selected randomly since the objective is not to estimate the characteristics

of the population but to get as wide a range as possible of reactions to the questions. By randomly assigning the households to two or more groups and by using a different version of the form for each group, the effect of variation in the wording of questions and in the format can be tested. Ordinarily a sample of about 50 to 100 households is adequate for a pretest but if small experiments are conducted then a somewhat larger sample would be needed.

Pretests may be conducted in different ways. For instance, interviewers can be trained to go beyond the regular interview by quizzing respondents about the meaning of the questions. Alternatively, quizzing of respondents may be deferred to reinterviews that are conducted by more highly trained interviewers than those who conducted the original interviews.

The single intensive interview pretest is conducted in the following manner:

(1) The questions on the survey form are divided among a small team of interviewers, and each interviewer is assigned two or three particular questions that are spread fairly well throughout the pretest form.
(2) The interviewer administers the pretest form as in a normal interview except for the particular questions he was assigned. Immediately after he gets a response to one of these questions he quizzes the respondent about that question.

Basically, there are two reasons why an interviewer is assigned no more than two or three questions for which he intensively quizzes the respondent. First, it limits the adverse effect of the quizzing on the normal procedure for administering the survey form. Second, it reduces the burden on interviewers and respondents.

To test a question, including the probing and challenging, takes two or three minutes. The interviewer quizzes the respondent with respect to (1) the respondent's interpretation of the question, including the meaning she gave to certain words, (2) her sensitivity to the content of the question, (3) the procedure she used to arrive at her reply, and (4) whether her reply was accurately reflected by the answer choices to the question.

The object of the quizzing is to search for problems in the design of the pretest form and to find ways of eliminating the problems. For instance, questions containing misunderstood words would be reworded, sensitive questions would be eliminated or repositioned on the survey form, probes would be added if the respondent failed to consider some facts in arriving at her reply, and the answer choices would be revised if they did not reflect the replies to the question.

The reinterview method of conducting a pretest is an elaboration of the single intensive interview pretest, that was previously described. It proceeds as follows:

(1) The pretest form is administered in a normal fashion by regular interviewers.
(2) Subsequently, intensive reinterviews are conducted by specially trained interviewers to evaluate the responses given to specific questions in the first interview.

The questions are repeated in the interview, and subsequently the responses are compared and reconciled with those made on the pretest form. The reinterview method is particularly effective in pretesting self-enumeration forms, namely forms completed by the respondents themselves. The intensive interviews are conducted after the pretest forms are completed by the respondents.

The final pretest of the survey form is the pilot study which serves as a full dress rehearsal for the entire survey and in which all survey operations are tested. In the pilot study, the survey form is tested in the context of the proposed data collection and data processing procedures. For instance, the adequacy of the form design with respect to data processing is tested by editing and coding the forms in the pilot study. The pilot study represents virtually the last chance to detect errors and reveal shortcomings with the view of making changes in the form before the survey is conducted.

II.32 *Technical Review* Technical review is defined by the U. S. Bureau of the Census as ". . . the process of checking by inspection, deduction and other analytic and judgmental means to locate and evaluate any sizeable errors that, despite quality controls, may remain in the data about to be published." Although

it is too late to change questions that are found to have problems after the survey is completed, the technical review serves the useful purposes of understanding the limitations of the data and improving the design of forms for later surveys.

The technical review for errors in the form design is based principally on tabulations of responses to each of the questions. The review involves a statistical analysis of the responses to check the reasonableness of the response, the nonresponse levels, and the consistency of reporting to different questions. For many survey questions there is a range within which the results would be expected to fall. If the results do not fall within that range, they would be suspect. For instance, the proportion of responses that are "don't knows" or "blanks" to different questions varies greatly. However, if the proportion for a particular question were deemed to be excessively high that item of information would be eliminated in the analysis of the survey results. Alternatively, it is sometimes possible to overcome the problems detected in technical review by collapsing or adjusting the response categories to a question. For instance, the impact of errors in the terminal digits of reported age may be reduced by using appropriate age intervals in the tabulations.

Sometimes, it is impossible on the basis of the technical review alone to evaluate the seriousness of the findings. Suppose for example that two-thirds of the respondents were self-respondents and one-third were proxy respondents and that four times as many births were reported by self as by proxy respondents. We might be suspicious that the number of births was underreported in the survey. However, we could not confirm or negate this suspicion on the basis of the results of the technical interview because we would not know whether (1) proxy respondents reported less well than self-respondents or (2) women who were reported by proxy respondents actually had fewer babies than women who reported for themselves. The uncertainty could be resolved by conducting controlled survey experiments.

III. Guidelines for Structuring Survey Forms

Guidelines for structuring survey forms are presented in this part of the manual. The composition of the form including its essential parts and their respective functions are briefly described first. Next, a systematic approach is outlined for structuring the subject matter parts of the survey form which contain the questions that correspond to the data requirements of the survey.

III.1 Composition of the Form

It is useful to distinguish between the cover page and the remaining parts of the survey form. The cover page usually contains information that deals primarily with data collecting operations. The remaining parts, which we will refer to as the contents of the form, contain the questions that are asked of the respondents in the survey.

III.11 *Cover Page* The cover or first page of the form contains information essential for identification and control purposes in the survey.

The title of the survey appears on the cover page. The identification of the type of form also appears on the cover page if more than one type of form is used in a survey. For instance, a survey of population change usually has one type of form to record information about the household and separate forms to record information about reported vital events. The cover page identifies a particular sample housing unit by an address and an identification number. The address fixes the household's exact geographic location and is indispensable to the interviewer who may have to make several visits before the interview is completed. An unique identification number is assigned to each household and hence to each form, to simplify the handling of the form during the data collection and subsequent operations of the survey.

Information pertaining to the field visits made to the household and the eventual outcome of the interview is recorded on the cover page. The information serves two purposes. It helps the interviewer to keep track of the past visits and to plan additional visits. It is useful to the administrator of the survey in evaluating the work of the interviewer and in deciding what further efforts should be made to visit a household if the interviewer fails to complete the interview.

Figure 1 illustrates the format for recording household visits. The interviewer completes a separate column for each visit. Usually at least two call-backs or a total of three visits are made when necessary to complete the interview.

Figure 1 Record of Household Visits

	Household Visit			
	1	2	3	4
1. Interviewer				
2. Date				
3. Time of day				
4. Outcome of visit				
completed				
refused				
not-at-home				
5. Name of respondent				
6. Reason for refusal				

In this illustration, it is assumed that up to four visits would be made. The interviewer records her name and the date and time of day of each visit. She records the outcome of the visit in item 4. If the interview was completed, the name of household respondent is recorded in item 5 and if the respondent refused to cooperate, the reason for the refusal is recorded in item 6.

The cover page of the survey form usually contains an introductory statement which explains the purpose of the survey. In surveys conducted by personal interview, the introduction is relatively short since it is believed that getting the interview underway quickly reduces the likelihood of an outright refusal. The introductory statement for a household survey of population change might read as follows: "The (name of sponsor of survey) is conducting a household survey to estimate the size of the population and the rate at which the population is growing." Sometimes a letter is sent before the interviewer visits the household. In addition to explaining the purpose of the survey, the letter tries to increase the likelihood of the household cooperating in the survey by describing the importance of the survey with respect to the uses to be made of the data, and by stressing the confidentiality of the information reported in the survey.

III.12 *Content of the Form* The survey form, except for the cover page, contains the questions that are asked of the household respondents. In addition to the questions including the answer choices for closed questions and the space to record answers to open questions, the contents of the form contain instructions to the interviewers and space for "footnotes and comments" is often reserved for the interviewer.

Instructions to the interviewers are scattered throughout the survey form since they usually relate to specific questions. On the basis of a response to a particular question, for example, the instructions may specify skipping subsequent questions on that form or for asking supplementary questions contained on a separate survey form. Instructions of these types will be illustrated in the subsequent chapters of this manual. The form used in a survey based on personal interviews rarely has a separate section devoted entirely to instructions to the interviewers because detailed instructions for conducting the interview are usually contained in the interviewer's manual.

III.2 Developing the Form Content

The design of the content of the form varies greatly from survey to survey depending on the topic and the general conditions of the survey. Experience has shown, however, that the procedures for developing and designing the content of the form are essentially the same in all household surveys. The procedures may be classified according to the following stages in the development of the form:

(a) specifying the information to be collected
(b) selecting the data collection strategy
(c) ordering the questions
(d) structuring the questions
(e) spacing the questions

It is important that the procedures are implemented in the order listed above. For instance, the questions themselves are not created until the next to the last stage. Developing the form is a dynamic process, however,

nd work on procedures in a later stage may esult in revising the procedures of an earlier tage. For instance, difficulty in wording a uestion may be eased by changing the order n which the question is asked.

III.21 *Information inventory* The initial tage in developing the contents of the form s to prepare a listing or inventory of the nformation that will be collected in the survey. The inventory which is based on the data equirements of the survey should be detailed and list the less important as well as the most mportant items of information. However, prep- aration of the inventory should not serve as an nvitation to add unnecessary items of infor- mation merely because it is easy to do so. Discipline should be exercised to list information f and only if it is needed, because each item of information adds to the cost of collecting, coding and tabulating the survey data. If tabulation specifications have been proposed, they will be useful in preparing the inventory.

At this initial stage, technical terms and concepts relating to the information specifica- tions should be fully defined. A particular concept may involve several items of infor- mation and preferably each item should be collected by a separate question. For example, household composition is a concept that defines the relationship among persons living together n the same housing unit. To determine the composition of a household would require three tems of information: (1) listing of persons iving together in the household, (2) identi- ication of the household head, and (3) rela- ionships of all listed persons to the household ead.

III.22 *Data Collection Strategy* The design of the form depends on the data collection trategy adopted in the survey. With respect o household surveys of population change, the major components of the data collection trategy are: (a) type of survey, (b) type of urvey form, (c) rules for selecting eligible espondents, and (d) rules for linking vital vents to dwelling units geographically and n time.

Type of Survey

Generally retrospective surveys of population change can be placed into one of two groups depending on whether the plan is to administer the survey form only once or more than once to the same sample household. The former survey is the single retrospective survey and the latter the periodic household survey. Consider, for example, the problem of estimating the number of deaths that occurred during a particular calendar period. The single retrospective survey is conducted after the close of the calendar period and the respondents report retrospectively the deaths that occurred during the calendar period. The periodic household survey involves interviewing the same households at east twice — at the beginning and end of the calendar period. Deaths would be identified primarily by noting the changes in the composition of the household between the two surveys, and by asking about deaths of infants that were born between the surveys.

Type of Survey Form

There are essentially two kinds of survey forms depending on whether the respondent completes the form himself or an interviewer completes it for him. The former form is a self-enumeration form and the latter a personal interview form. Surveys of population change among respondents having high rates of illiteracy are always conducted by personal interviews.

Respondent Rules

Many kinds of respondent rules can be adopted in a household survey. These rules specify which persons are eligible to serve as respondents in the household. If the household respondent reports for himself he is called a self-respondent. If he responds for another person he is called a proxy respondent. Sometimes the respondent rule specifies that only self-respondents may report in the survey. Other times the rule states specific conditions under which any adult or a particular adult may serve as a proxy respondent for specified other persons or all other persons in his household or possibly in other households. It is usually more expensive to interview only self-respondents because more visits are generally required to find them at home. However,

certain types of information are reported more accurately by self than by proxy respondents so the additional expense may be justified. In surveys of population change, fertility data are usually collected from female self-respondents. On the other hand, deaths are necessarily reported by proxy respondents, but respondent rules are necessary to identify which proxy respondents are eligible to report the deaths.

Counting Rules

It is essential to establish rules that specify the dwelling units at which persons will be counted in the survey. Rules for linking persons to the dwelling units where they will be enumerated in the survey may be called counting rules. Either *de jure* survey or *de facto* residence rules may be adopted. Both rules if properly implemented assure complete coverage of the entire population without duplication. According to the *de jure* rule, the person is enumerated at his usual place of residence and according to the *de facto* rule, the person is enumerated at the place he is staying at the time of the survey.

Neither residence rule is particularly well suited to the problem of linking births and deaths to the housing units where they will be enumerated in the single retrospective surveys. Persons who died during the prior calendar period obviously are neither residents of nor visitors at any housing units when the survey is conducted. Hence in a literal sense deaths cannot be linked to housing units either by *de jure* or *de facto* rules. Either rule is suitable for counting babies that were born during the prior calendar year that survive to the survey date, but neither is well suited for counting babies that were born during the prior calendar year and died prior to the survey.

There are a large number of different counting rules that may be adopted in single retrospective surveys. The kind of rule adopted varies from survey to survey depending on the population being studied. One class of counting rules called "conventional rules" establishes that each vital event is uniquely linked with one and only one housing unit. Examples of this type of rule with respect to counting births and infant deaths are presented in Chapter 4 and with respect to counting non-infant deaths are presented in Chapter 5. The other class of counting rules which links each vital event to one or more housing units, is called a "multiplicity rule." For example, a multiplicity rule for births is "births are reported either by the parents or grandparents of the baby." According to this rule a newborn baby would be reported by all housing units that contained either its parents or grandparents. Both types of counting rules are capable of producing unbiased survey estimates of births and deaths. However, only limited research has been completed with respect to the multiplicity rules, which require the collection of supplementary information in the survey. Therefore, we will limit our discussion to conventional rules.

III.23 *Charting the Basic Logic* The objective of this procedure is to order the questions on the form so that the items of information are collected as needed from all respondents and unnecessary items of information are not collected from any respondent. There are two phases to charting the basic logic of the survey form. First, the substantive information is subdivided into major sections. Second, the individual items of information are ordered within the sections. These operations are comparable to those of outlining a manuscript. First, the manuscript is subdivided into the major parts. Second, the content of each part is specified.

Usually several kinds of information will be collected in the survey. It is desirable to arrange these items of information such that those items included in the same section of the form have a common frame of reference. The frame of reference is sometimes determined on the basis of the unit to which the information pertains. For example, questions pertaining to (1) the household, (2) persons living in the household and (3) former members of the household who died would be asked in three separate sections: (1) a household section, (2) an individual section, and (3) a decedent section, respectively. Alternatively, the frame of reference may be determined on the basis of the kind of information. For example, questions pertaining to demographic-status characteristics would be asked

in one section and questions pertaining to vital events would be asked in another section of the form. The several possible ways of sectioning the form should be carefully explored and finally that particular way selected which makes the form most comprehendible and easy to follow.

Some suggestions may be offered for ordering of different sections of the form. It is desirable to arrange the sections so that the form proceeds naturally from one topic to another and keeps the respondent's interest. Usually, the first section asks for information that would be most interesting and least likely to cause anxiety to the respondent. Questions with a high potential for generating anxiety are usually reserved for the middle or later sections of the form. If two or more sections are equal in terms of interest or anxiety potential, the sections may be ordered by the relative importance of the information in the survey.

Within each section of the form, items of information are serially numbered and they are completed in that order by the interviewer unless the instructions on the form specify otherwise. Rarely will every item of information be applicable to every respondent. The instructions on the form specify the conditions under which particular items are skipped. The most likely condition for skipping items is the response given to a preceding item.

There are several bases for choosing among alternate ways of arranging a set of questions. Skip patterns are nearly always adopted so that respondents are asked to provide only those items of information that are relevant to them. The arrangement that requires the fewest number of skips is usually preferred. However, an important objective is to select skip patterns that are easy for the interviewer and the respondent to follow. Experience indicates that respondents sometimes answer questions in a way that places the minimum burden on them. For instance, they may be inclined to give an incorrect response to a screening question which might be selected if the respondent anticipated that it would reduce the number of subsequent questions that he would be asked.

Other bases for arranging items of information on the form include (a) the importance of the item and (b) the sensitivity of the item. Usually, essential questions are asked toward the beginning of the form and sensitive questions in the middle or toward the end, but not at the very end of the form.

The ordering of the questions as well as the wording of the individual questions should be pretested. In particular, the pretest should investigate the possibility that the arrangements of the items might adversely affect the respondent's interpretation of the meaning of the questions.

III.24 *Structuring the questions* The problem of wording the individual questions we have emphasized is not the first order of business in designing the form. The individual questions are constructed only after important decisions have been made regarding the information to be collected, the strategy for data collection and the basic logic of the form. These decisions provide the mold for constructing the individual questions. More particularly, the basic logic of the form provides a blueprint for designing the questions in much the same manner that the flow chart of the logic of a computer program provides a blueprint for writing instructions for the computer program.

Considerable care is required in structuring and wording of individual questions. We probably know more about procedures for developing forms than we do about ways of asking questions. The job is greatly facilitated, however, by knowing as precisely as possible the purpose of each question beforehand. Since the criteria for assessing goodness of questions were discussed in Chapter 2, they will not be repeated here. It is worth repeating, however, that the final test of a question is how well it is understood and how accurately it is answered by the respondent. Consequently, it is essential to conduct pretests before preparing the final version of questions.

III.25 *Format* The number of different ways that a set of questions can be arranged and printed on a sheet of paper is virtually limitless. There are two major considerations in designing the format: (a) to enhance the completeness and quality of the information reported and (b) to facilitate the editing and coding of the reported information.

The primary consideration is to display the questions and instructions on the form in a manner that enhances the reporting of information in the survey. The following are some criteria for designing a good format: (a) spacing between questions and answers and between contiguous and consecutive questions should avoid crowding and overall present an uncluttered appearance, (b) size of type should be readable and a different kind of type or font should be used for questions than for instructions, and for answer categories that are read aloud by interviewers than for those that are not and (c) the use of visual aids such as arrows should clearly specify the pattern of skipping questions.

The format should facilitate the data processing and tabulating. However, aids for processing the form should not interfere with the form's primary function which is to obtain complete and valid information from respondents. Space may be reserved on the form to enter numerical codes and thereby eliminate the need for separate coding sheets but not if it interferes with collecting the information. In large statistical surveys it is sometimes feasible and economical to design forms so that the information reported on the survey form is transformed directly into punch cards or computer tape without the intervention of any manual coding or encoding. However, the specifications for machine readable forms are very exacting and usually place restrictions on the format design. Also the machine readable forms require special reading machines on which the survey forms should be thoroughly pretested before the final forms are printed.

A technical discussion of the mechanical arts for laying-out and printing survey forms is outside the scope of this manual. Specialists in these matters should be consulted particularly in large surveys where the costs of relatively expensive methods of producing forms would have small impact on the unit costs per printed form.

IV. Form Design for a Natality Survey

In Chapter 3, we presented guidelines for structuring survey forms in a systematic way. We illustrate and apply those guidelines in this chapter to develop forms for a natality survey. First, we identify the items of information to be collected in the survey. Second, we assemble and arrange the items of information within each of the major parts of the survey forms. Lastly, we prepare questions corresponding to the items of information.

IV.1 Survey Specifications

The items of information to be collected from the sample housing units in the survey are determined jointly by the data requirements and the data collection strategy. In this section, we specify the data requirements and the data collection strategy of the natality survey.

IV.11 *Data Requirements* The objective of this illustrative natality survey is to produce birth, infant death, and related demographic statistics for the non-institutional civilian population for a specified calendar year, say 1970. For this illustration it is assumed that the following tabulations will be derived from the survey:

Population statistics

1. Civilian noninstitutional population classified by age, sex, and geographic subdivision of the country.

Natality statistics

1. Births classified by parity, age of mother, and geographic subdivision.
2. Births classified by age of mother, sex of child, and geographic subdivision.

Infant mortality statistics

1. Infant deaths, under one month and over one month of age classified by sex and geographic subdivision.

These tabulations possibly specify less than the minimum number of items of information that would be produced by an actual survey. These particular data requirements were specified principally on the basis of their value in illustrating the principles of forms design. From this viewpoint, it is helpful to keep the number of variables to a minimum. In an actual natality survey, the specifications would probably be expanded to collect demographic items of information including household composition, educational attainment, religion, race, income, occupation, place of birth, as well as other items

of information such as who attended the mother at birth.

The tabulation specifications listed above refer to certain technical terms that need to be defined:

(a) *Noninstitutional civilian population:* Refers to persons living in private housing units. It excludes persons living in correctional and penal institutions, in residential care institutions such as chronic disease hospitals, boarding schools, and on military installations.

(b) *Usual place of residence:* The geographic location of the housing unit in which the person resides on the date of the survey.

(c) *Birth:* According to the U. N. definition a birth is "the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows any other evidence of life. . . ."

(d) *Infant death:* The death of an infant within one year after live birth. This definition excludes foetal deaths.

(e) *Parity:* Refers to the number of live births a woman has experienced.

(f) *Geographic subdivision:* Refers to a grouping of adjacent states or provinces. For demographic purposes, a country is usually divided into four to ten geographic regions.

According to the data requirements, provision needs to be made on the survey forms of the natality survey for the following items of information:

Persons in households

1. Geographic region of usual place of residence
2. Age by single years up to age 5 and by 5 year age intervals thereafter
3. Sex

Births

1. Geographic region of place of residence of mother at birth
2. Parity
3. Age of mother by 5 year age intervals
4. Sex of baby

Infant deaths

1. Geographic division of place of residence at death
2. Age classified as under one month, and one month to one year of age
3. Sex of baby

IV.12 *Data Collection Strategy* The data collection strategy adopted for this illustrative natality survey specifies the following:

Type of survey: Single retrospective survey.

Type of survey form: Form administered by interviewers.

Respondent rules: The household head or any related person 18 years or older is eligible to report the items of information about persons living in the household. The head of the household or his wife are eligible to report the supplementary information needed for births and infant deaths. The wife is the preferred respondent.

Counting rules: Persons (including infants) who are alive on the enumeration date are enumerated on a *de jure* basis, that is, each person is counted in the household that represents his place of residence. Infants that have died are enumerated in their mothers' households.

Let us briefly consider the reasoning that lead to adopting this particular data collection strategy and the implications of the strategy on the design of the survey forms.

Type of Survey

Let us say, that the single retrospective survey was adopted because the decision to conduct a natality survey was not made until June 1970. Hence, it was too late to conduct a periodic household survey which would have required conducting the first round of interviewing during January 1970. It is important to conduct this single retrospective natality survey as early as possible after calendar year 1971 begins because the reference period for reporting births and infant deaths is calendar year 1970. A survey conducted before the end of 1970 would miss the vital events that occurred later in the calendar year 1970. Conducting the survey toward the middle or end of 1971, would lengthen the recall period and experience indicates that

lengthening the recall period tends to lower the completeness of reporting of vital events.

Type of Survey Form

We specify that the survey forms will be completed by interviewers because self-enumeration methods of collecting the information would not be feasible in many countries, particularly those countries with high rates of illiteracy.

Respondent Rules

The kinds of respondent rules that are adopted in the survey depend principally on the items of information being collected. For instance, experience indicates that the head of the household or any person related to him could report reasonably well the particular items of information being collected in this survey about persons living in the household. However, it is doubtful that every adult, particularly the adults unrelated to the household head, would be good respondents for identifying infant deaths and for reporting the supplementary items of information being collected for births and infant deaths in this survey. Usually, self-responding women are designated as the only eligible respondents in fertility surveys collecting lifetime fertility histories. In this survey, however, the reference period for reporting births and infant deaths is limited to one year. Consequently it was decided that either the head of the household or the wife of the household head would be eligible respondents to report this information for all household members. If both the husband and wife are available, the interview is conducted with the wife since she has been designated as the preferred respondent. The adequacy of these respondent rules would, of course, need to be explored by conducting pretests.

It is noteworthy that the respondent rule requires an item of information about persons living in the household that was not specified by the data requirements of the survey, namely we need to be able to identify the head of the household and related persons. Consequently we will have to make provision on the survey form for collecting information on the composition of the household.

Counting Rules

A requirement of the counting rules that we are considering in the natality survey is that each person in the civilian noninstitutional population living in the country on the survey date and each infant death and birth that occurred during calendar year 1970 is uniquely linked to one housing unit where it would be enumerated if that unit was selected in the sample. If the "uniqueness" requirement is satisfied, each living person and infant that died during 1970 is linked to one and only one housing unit. The *de jure* counting rule that we adopted meets this requirement for persons living in housing units. Persons without a fixed place of residence, however, and persons who live in a residential type place of residence such as a chronic disease hospital or an institution for the aged and persons living on military posts would be missed. Ordinarily, they represent a small percentage of the living population. We are limiting the scope of the survey to the civilian non-institutional population because of the unique sampling and data collection problems associated with surveying institutional and military populations.

The rules with respect to counting infant deaths meet the "uniqueness" requirement if the infants that died during calendar year 1970 are survived by their mothers. However, if the mother died before the survey was conducted, the baby would not be linked to a housing unit and hence would be missed in the survey. We are assuming that this would not occur frequently enough to present a serious problem in the natality survey. Otherwise we would have revised or supplemented the counting rules to deal with the problem. For instance, a rule might be adopted to link the infant deaths to the housing units in which the deceased mothers formerly lived. It is noteworthy that the adoption of that particular rule would require the survey form to make provision to include items of information to identify women who died during 1970 and during 1971 prior to the enumeration date to determine if any of these women had infants under one year of age that died during 1970. We will illustrate how this might be done in connection with designing forms for a mortality survey in Chapter V.

IV.2 Charting the Logic

The data requirements and the data collection strategy specify that the natality survey will collect essentially three kinds of information from each household: (1) basic demographic items of information for each member of the household, (2) items of information to identify the births and infant deaths, if any, that would be reported by the household in compliance with the counting rules of the survey, and (3) items of information for every birth and infant death reported by the household. This seems like a natural order in which to assemble the items of information on the survey form.

The design of the survey form is complicated by the fact that the number of reported births and infant deaths will vary among the households in the survey. Most households would be expected not to report any births or infant deaths and a small fraction would be expected to report more than one vital event. In the United States, for instance, more than ninety-five percent of the households would be expected not to report any births within the one-year reference period and a fraction of one percent to report more than one event. The percentages would, of course, vary by country depending on the birth rate and the size of the households.

The variable number of events would most affect the design of the section of the form containing items of information for reported births and infant deaths. The set of items of information needed for these vital events would need to be repeated sufficiently often on the form to handle the maximum number of births and infant deaths that a household might be expected to report. This would not be a particularly attractive resolution of the problem when we know beforehand that most of the households would report neither a birth nor an infant death. Therefore, we will resolve the problem in another way, namely, a separate form will be designed which will contain the items of information needed for each birth and infant death. The form will be called the Birth Form.

Consequently, there will be two different forms in the natality survey. The Household Form will contain the items of information needed (1) for each member of the household and (2) to identify the births and infant deaths. The Household Form will be administered to every sample household. A separate Birth Form will be completed for every infant under one year of age living in the household that was born during 1970 and for every infant under one year of age that died during 1970 whose mother lives in the household. A flow chart of the overall plan for the form design is presented in Figure 2.

IV.21 *Household Listing* Provision needs to be made on the survey form to collect the following demographic items of information for every person residing in the sample household: place of residence, relationship to household head, age and sex. Place of residence, which is the same for each member of the household, is however, an item of information that need not be provided by the household respondent. On the contrary it is determined from the address of the household that appears on the face sheet of the Household Form.

First priority is given to enumerating the persons residing in the household. Next, the relationship to the household head, age and sex of each household member is obtained. These will be referred to as the person items of information. Finally, several probing questions are asked to identify residents of the household that the respondent may have failed to report. A flow chart of the items of information is presented in Figure 3.

IV.22 *Screening births and infant deaths* Provision needs to be made to include on the survey form whatever items of information are needed in order to identify 1) infants born during 1970 who reside in sample households and 2) infants who died during 1970 and whose mothers reside in sample households. It is noteworthy that (1) the infants who died during 1970 may have been born either in 1969 or 1970 and (2) infants who were born during 1970 include those who are living in the household and those who died prior to the survey but whose mothers are living in the household. The latter include infants that died during 1971 prior to the survey but who were born during 1970. However, we shall ignore these infants under the assumption that the survey was conducted early in January 1971.

All persons, including infants, that reside in the household are included in the household listing. However, the infants living in the household who were born during 1970 could not be identified from this source unless the year of birth was obtained.

Essentially two items of information are needed to identify the infant deaths (a) whether or not any women currently living in the household had an infant who died during 1970 and (b) the identity of the infant deaths if any. However, these items of information would not be asked if the household did not contain any females who were in the reproductive ages—a fact that can be established from the information contained in the household listing.

A flow chart of the items of information needed to identify births and infant deaths is presented in Figure 4.

IV.23 *Birth form* Listed below are the items of information needed for births and infant deaths:

Birth items of information
1. Parity
2. Age of mother
3. Place of mother's residence at birth of baby
4. Sex of infant

Infant deaths items of information
1. Age at death
2. Place of residence at death
3. Sex of infant

From the viewpoint of designing the survey forms, it would be simpler to have two vital event forms and complete a separate birth form for each infant living in the household and a separate infant death form for each reported infant death. Nevertheless, we believe it is preferable to combine the information needed for children living in the household and for infant deaths into a single form primarily because there is overlap among the items of information collected for both types of infants in the natality survey.

The infants reported in the survey may be divided into three mutually exclusive groups: (1) infants living in the household who were born during 1970, (2) infants who died during 1970 and were born during 1969, and (3) infants who died during 1970 and were born during 1970. For the first group of infants the birth items of information are needed with the exception of the "age of mother" and "sex of infant" which are available from the Household Listing. For the second group of infants, the infant death items of information are needed. The third group of infants, however, represent both births and infant deaths that occurred during 1970 and hence the infant death items of information are needed and the birth items of information are also needed with the exception of "age of mother" which is available from the Household Listing.

A flow-chart of the structure of the Birth Form is presented in Figure 5. The identification items include the household identification number, the name and sex of the infant and the name of the mother. It is particularly noteworthy that the flow-chart presumes that the three types of infants noted above are discernible and readily identifiable before asking the birth items and the infant death items of information.

An alternative flow-chart of the Birth Form is presented in Figure 6. It presumes that only two types of infants are identified prior to asking the birth and infant deaths items: (1) infants who are living in the household and were born during 1970, and (2) infants who died during 1970 and whose mothers are living in the household. The two kinds of infant deaths, namely those born in 1969 and 1970 respectively, are identified during the process of completing the infant death items.

IV.3 Structuring the Questions

In the first section of this chapter, we identified the items of information consistent with the data requirements and data collection strategy for which provision needs to be made on the survey form. We concluded in the second section that two kinds of survey forms are needed, namely a Household Form and a Birth Form. The items of information on the Household Form describe the individuals living in the household and identify the infant deaths that occurred during 1970. The items of information on the Birth Form describe the babies that were born and/or that died during 1970. We investigated the logical connections between the items of information and on that basis prepared detailed flow-charts to indicate the arrangement of the items on the survey forms. These flow-

Figure 2 Structure of the Natality Forms

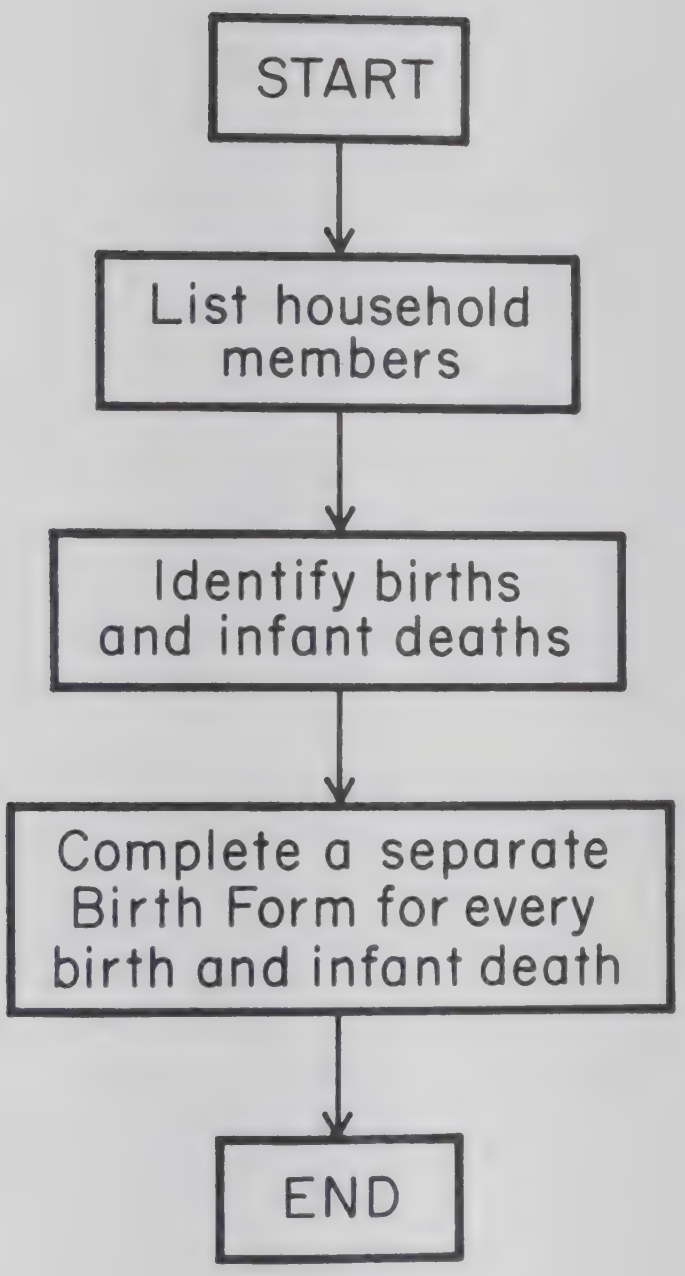

START
List household members
Identify births and infant deaths
Complete a separate Birth Form for every birth and infant death
END

Figure 3 Flow Chart of the Household Listing

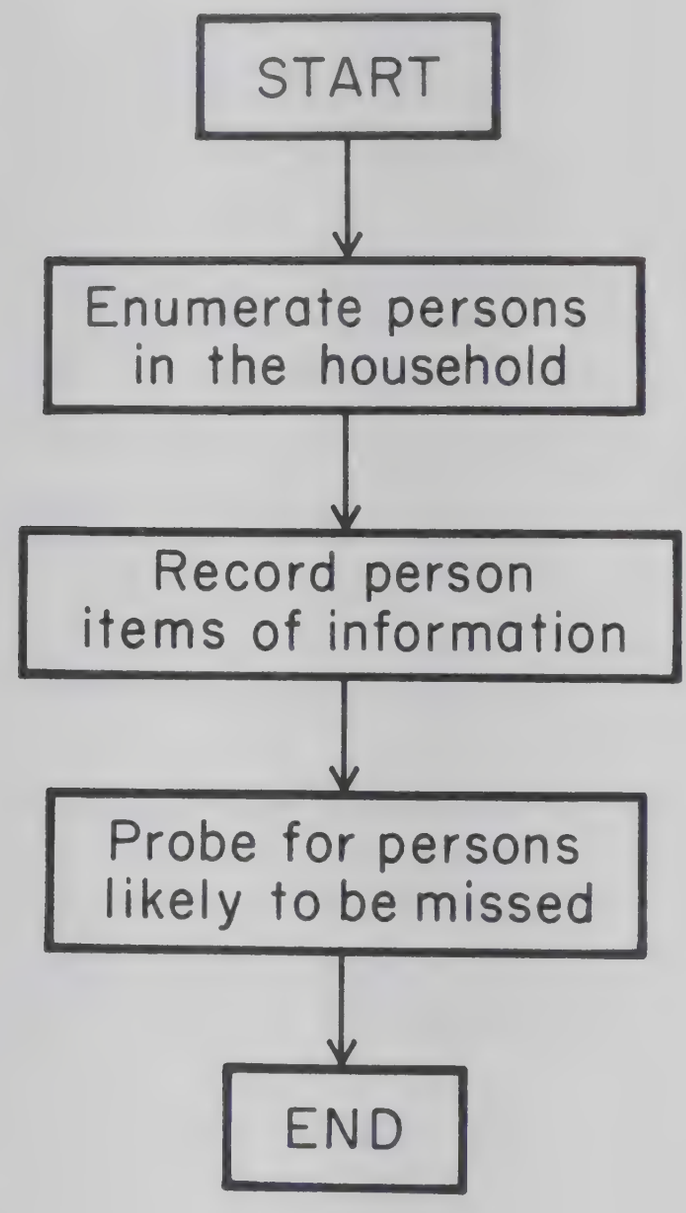


Figure 4 Flow Chart to Identify Births and Infant Deaths

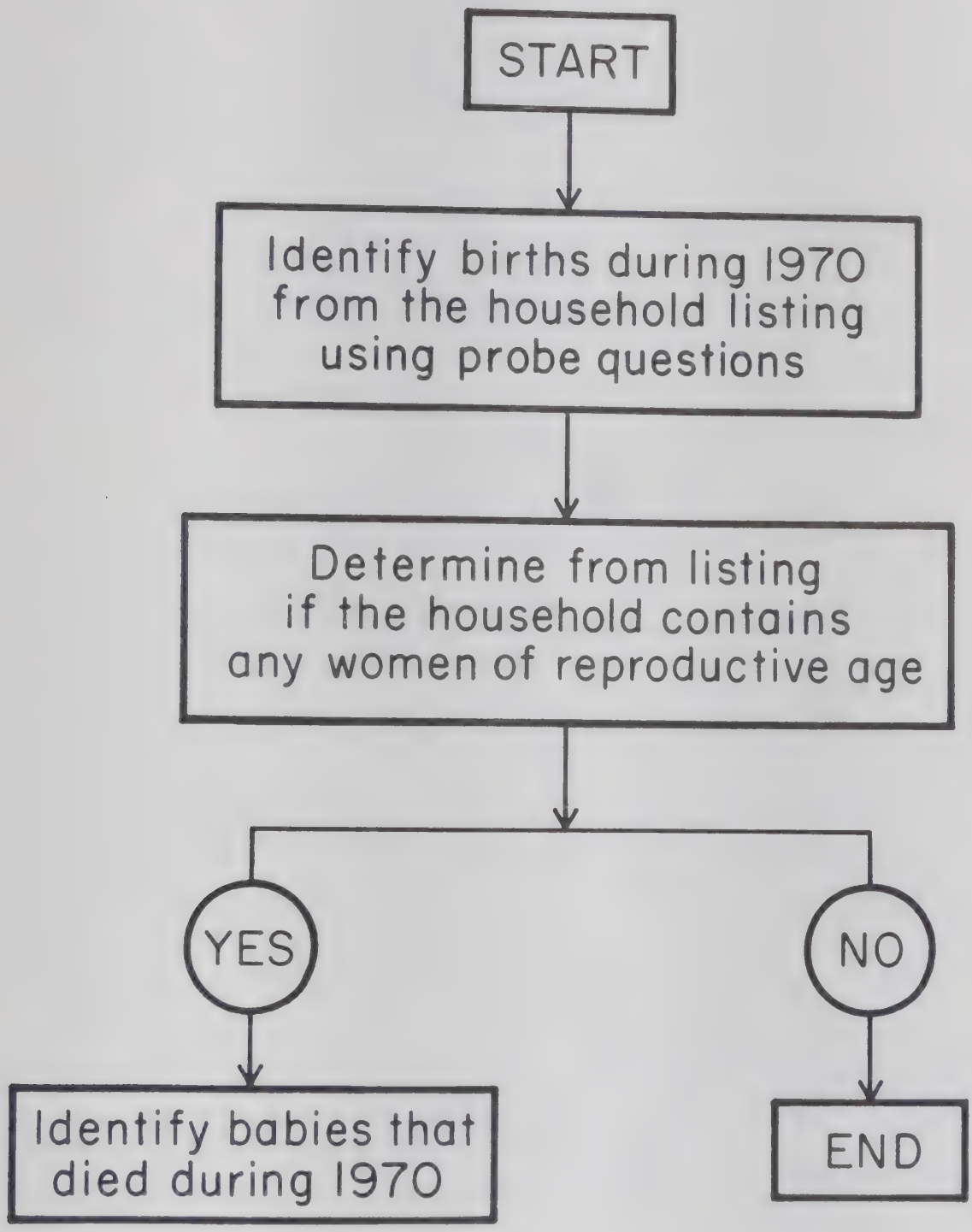

START
Identify births during 1970 from the household listing using probe questions
Determine from listing if the household contains any women of reproductive age
YES
NO
Identify babies that died during 1970
END

Figure 5 Flow Chart of the Birth Form

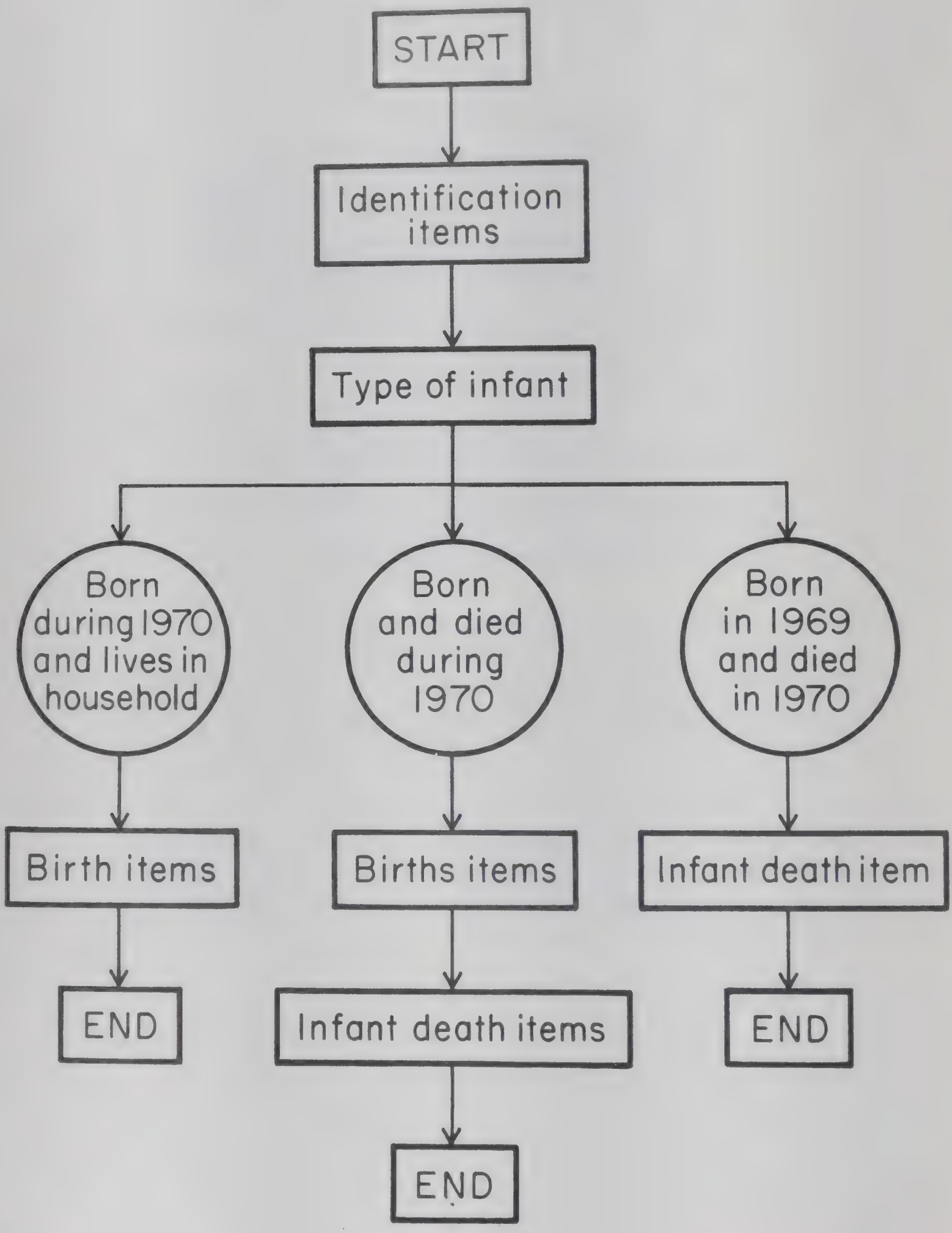
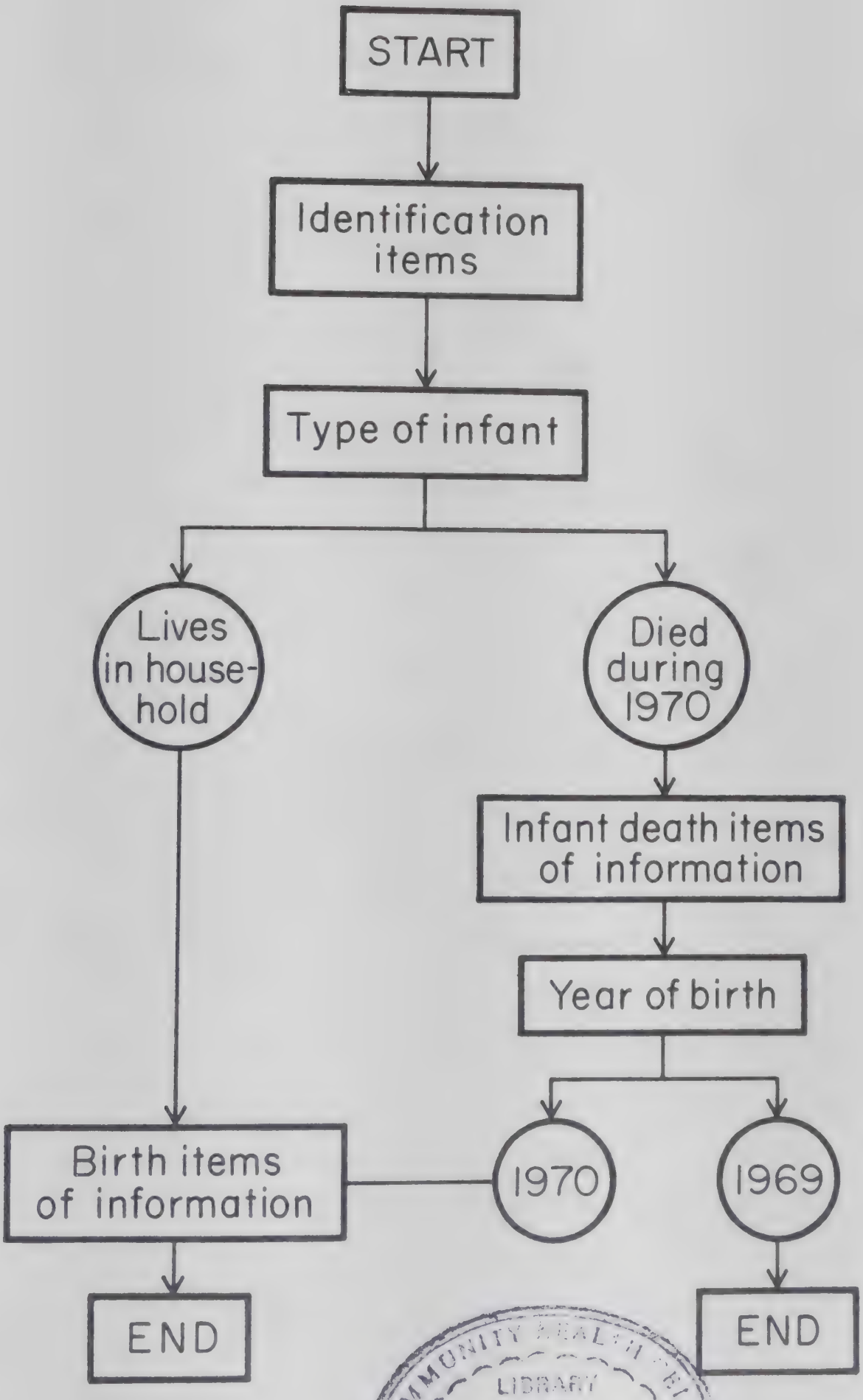


Figure 6 Alternate Flow Chart of the Birth Form



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AND
INFORMATION
CENTER

Figure 7 Household Form

Section I Household Listing

Line I.D.	What is the name of the head of this household? What are the names of all other persons who are living or staying here? LIST ALL PERSONS, FAMILY NAME FIRST, STAYING HERE AND ALL PERSONS WHO USUALLY LIVE HERE WHO ARE ABSENT.	What is the relationship of . . . to the head of the household?	Sex	What was . . .'s age at last birthday? (IF MORE THAN FIVE YEARS SKIP ITEM 5)	When was . . . born? Month	Year
	(1)	(2)	(3)	(4)	(5)	
A	_____	HEAD				
B	_____					
C	_____					

(6) I have listed [READ NAMES IN ITEM (1)].

Have I Missed:

(6.1) Any babies or small children? ☐ Yes ☐ No

(6.2) Any lodgers, boarders or persons in your employ who live here? ☐ Yes ☐ No

(6.3) Anyone who usually lives here but is temporarily at school, or in a hospital, on business or vacation or a visit? ☐ Yes ☐ No

ENTER IN ITEM (1) ANY PERSONS REPORTED IN ITEMS (6.1), (6.2), or (6.3).

Figure 8 Household Form

Section II Identification of Births and Infant Deaths

(7) REFER TO ITEM (5): ARE THERE ANY INFANTS WHO WERE BORN DURING 1970?

☐ YES → COMPLETE A BIRTH FORM FOR EACH INFANT.

☐ NO

(8) REFER TO ITEM (4): ARE THERE ANY WOMEN IN THE AGE GROUP 15 TO 45 YEARS?

☐ YES

☐ NO → END OF INTERVIEW

(9) Did (READ NAMES OF WOMEN 15 TO 45 YEARS OLD) give birth during 1970 to babies that died during 1970?

☐ YES → 9.1 What were the names of the babies that died? _____

☐ NO COMPLETE A BIRTH FORM FOR EACH INFANT

(10) Did (READ NAMES OF WOMEN 15 TO 45 YEARS OLD) give birth during 1969 to babies that died during 1970 before reaching one year of age?

☐ YES → 10.1 What were the names of the babies that died? _____

_____

COMPLETE A BIRTH FORM FOR EACH BABY.

☐ NO

Figure 9 Birth Form

Section I Identification Information

(1) HOUSEHOLD IDENTIFICATION NUMBER

(2) NAME OF MOTHER

(3) NAME OF MOTHER'S BABY

(4) WHERE IS THE BABY'S NAME LISTED ON THE HOUSEHOLD FORM?

- ☐ ITEM (1) → ASK SECTION II ONLY
- ☐ ITEM (9) → ASK SECTION II AND III
- ☐ ITEM (10) → ASK SECTION III ONLY

Section II Births

(5) Where did . . . . . live when her baby was born?

- ☐ In this housing unit
- ☐ Elsewhere → (5.1) In which province? _____

(6) To how many children has . . . . . given birth? _____

Did you include
[READ NAME OF BABY IN (3)]

(6.1) All . . . . .'s own children living here?	☐ YES	☐ NO
(6.2) All . . . . .'s own children who may live somewhere else?	☐ YES	☐ NO
(6.3) All . . . . .'s own children who may have died?	☐ YES	☐ NO

REVISE THE NUMBER RECORDED IN (6) TO INCLUDE ANY ADDITIONAL CHILDREN REPORTED IN (6.1), (6.2), or (6.3).

Section III Infant Deaths

(7) Was the baby a boy or a girl? ☐ Boy ☐ Girl

(8) When was the baby born? _____ (month) _____ (year)

(9) When did the baby die? _____ (month) _____ (year)

(10) Where was the baby living when it died?

- ☐ In this housing unit
- ☐ Elsewhere → (10.1) In which province? _____

Figure 10 Birth Form — Alternate Version

Section I Identification Information

(1) HOUSEHOLD IDENTIFICATION NUMBER

(2) NAME OF MOTHER

(3) NAME OF . . . . .'s BABY

(4) TYPE OF BABY

☐ BABY LIVING IN HOUSEHOLD → SKIP TO SECTION II

☐ BABY DIED → GO TO SECTION III

Section II Births

(5) Where did . . . . . live when her baby was born?

☐ In this housing unit

☐ Elsewhere → (9.1) In which province? _____

(6) How many children has . . . . . given birth to? _____

Did you include

[READ NAME OF BABY IN (3)]

(6.1) Are all of . . . . .'s own children living here?	☐ YES	☐ NO
(6.2) Are any of . . . . .'s own children who may live some place else?	☐ YES	☐ NO
(6.3) Have any of . . . . .'s own children who may have died?	☐ YES	☐ NO

REVISE THE NUMBER RECORDED IN (6) TO INCLUDE ANY ADDITIONAL CHILDREN REPORTED IN (6.1), (6.2), or (6.3).

Section III Infant Deaths

(7) Was the baby a boy or a girl? ☐ Boy ☐ Girl

(8) Where was the baby living when it died?

☐ In this housing unit

☐ Elsewhere → (6.1) In which province? _____

(9) When did the baby die? _____ (month) _____ (year)

(10) When was the baby born?

Month _____ and year

☐ 1969 → END

☐ 1970 → GO TO SECTION II

charts will serve as the blueprints for creating the questions themselves which we are now ready to undertake.

IV.31 *Household Form* The Household Form is subdivided into two sections namely, the Household Listing and the identification of Births and Infant Deaths. The flow-charts of the two sections were presented in Figures 3 and 4 respectively. We will use these flow-charts as our guides in creating the questions for these sections.

Fortunately, a well-tested procedure and standardized questions have been developed over the years for preparing a list of the persons living in a household and for asking items of demographic information for each person. The conventional approach is presented in Figure 6. Item (1) produces the listing of persons in the households. Items (2) - (5) correspond to the person items of information. Items (2) and (3) correspond to "relationship to household head" and "sex" respectively. Items (4) and (5) correspond to "age." Item (4) should be easier than item (5) to answer particularly for proxy respondents. The month and year of birth is needed to determine the age of a mother as of the birthdate of her baby, and the year of birth is needed to identify the babies living in the household that were born during 1970. The response to question (5) also serves as a check on the reliability of the response to item (4).

Three conventions that were adopted in Figure 7 are noteworthy. Instructions to interviewers are typed in upper case font to differentiate them from questions asked of respondents which are typed in lower case font. The symbol . . . is used to refer to the names of specific individuals. The questions on the form are referred to as items and each item is identified by a number contained in brackets. For instance item (2) in Figure 7 refers to the question "what is the relationship of . . . to the head of the household?" We will use Roman numerals instead of arabic numerals to identify the sections of the form. These three conventions will be followed on the Household Form, the Birth Form, and the Noninfant Death Form which will be developed in the next chapter of the manual.

The proposed questions for the second section of the Household Form are presented in Figure 8. These questions correspond to the flow-chart presented in Figure 4. Items (7) and (8) are instructions to the interviewer and do not collect information from the respondent. They might have been presented on the form in the following manner:

INSTRUCTIONS TO THE INTERVIEWER:
REFER TO (5), AND COMPLETE A SURVEY BIRTH RECORD FOR EACH INFANT IN THE HOUSEHOLD THAT WAS BORN DURING 1970.
REFER TO (4) AND SKIP THE FOLLOWING QUESTIONS IF THE HOUSEHOLD DOES NOT CONTAIN ANY WOMEN AGED 15 TO 50 YEARS.

We prefer to state the instructions as questions to the interviewer, in this instance, because the questions require the interviewer to record her observations on the form. We feel that this may be a more foolproof method of making sure that the interviewers carry out the instructions.

Items (9) and (10) identify the babies that died during 1970 and whose mothers live in the household. The information might have been collected by a single question, namely "Did (READ NAMES . . .) give birth to any live babies during 1969 or 1970 that died during 1970?" We believe this single question would be less comprehendible to the respondent than questions (9) and (10). However, the principal reason for asking the questions in this way is that we previously structured the flow chart (see Figure 5) of the Survey Birth Form on the presumption that deaths of infants that were born during 1969 would be distinguishable from those born during 1970.

Consideration was given to the possibility of asking items (9) and (10) separately for each woman 15 to 50 years old living in the household. This possibility was rejected as being too tedious under the circumstances since rarely would there be more than one woman in a household whose infant had died during the previous year.

Items (9.1) and (10.1) ask for the names of infants that died. However, an infant that dies does not always have a given name, especially if it died immediately after birth. Consequently, the interviewers would be instructed to identify unnamed infants. For instance, unnamed infants could be identified by different letters of the

alphabet assigned in the usual alphabetical order, that is, Baby A for the first unnamed infant in a household, Baby B for the second, etc.

IV.32 *Birth Form* A draft of the Survey Birth Form is shown in Figure 9. It was constructed on the basis of the flow chart presented in Figure 5. Sections 1, 2, and 3 correspond to the identification items, birth items, and infant death items respectively. Section 2 does not contain items for "age of mother" and "sex of baby" and Section 3 does not contain the item for "age of mother" because these items of information are available from the Household Listing Section of the Household Form. (To facilitate data processing, it might be advisable to repeat these items on the survey birth form.) Should a completed Birth Form become separated from its respective Household Form, it would be linked by means of the Household Identification Number which appears on the face sheet of the Household Form and which is the first item listed on the Birth Form.

Item (4) on the Survey Birth Form classifies the "type of infant." It is crucial that the interviewers understand this item and answer it correctly. (viz. Items (5), (9), and (10) respectively of the Household Form identify infants living in the household, deaths of infants that were born in 1970 and deaths of infants that were born in 1969.) Otherwise, the interviewers would be directed by the instructions to complete the wrong sections of the Birth Form and consequently, they would fail to complete the appropriate items of information for births and infant deaths.

An alternative version of the Birth Form is presented in Figure 10. It is based on the flow chart that was presented in Figure 6. On this version of the Birth Form the infant is classified by item (4) according to whether the infant lives in the household or the infant died. The year of birth of the infants that died is determined subsequently by item (8).

Whether or not there would be any appreciable difference in using this version of the Birth Form or the one presented in Figure 9 is not obvious, and consequently, both versions might be pretested. In general, it is advisable to test alternative versions of those parts of the survey forms or of particular questions that appear to present particular problems.

V. Form Design for a Mortality Survey

In this chapter, we expand the objectives of the natality survey as described in Chapter 4 to include the collection of mortality data. Survey forms to collect information about non-infant deaths will be designed and will be integrated with the natality forms that were previously designed to collect statistics on births and infant deaths. In developing the forms for the mortality survey we apply the same systematic approach that we previously illustrated in the preparation of forms for a natality survey. The forms themselves are not definitive but are used to show the process involved in the design of this general class of forms.

V.1 Survey Specifications

In this section, we specify the data requirements, and the data collection strategy of the mortality survey. We are proposing to integrate the forms of the mortality survey with those previously developed for the natality survey into a single set of forms for a survey of population change. Therefore, we will adopt the data collection strategy of the natality survey with respect to the type of survey, namely, a single retrospective survey and also with respect to the type of survey form, namely, a form administered by interviewers.

V.11 *Data requirements* The mortality component of the survey of population change will produce mortality statistics based on non-infant deaths that occurred during 1970 to the noninstitutional civilian population. These deaths will be classified by age, sex and geographic subdivision of the country in which the deceased person resided at the time of death. According to these illustrative data requirements, provision needs to be made on the mortality survey forms to collect the following items of information for non-infant deaths:

1. Geographic region of place of residence at death
2. Age: 1-4 years and 5 year age intervals thereafter
3. Sex

These three items probably represent less than the minimum items of information that would

be collected in an actual mortality survey. In an actual survey, the specifications would be expanded to collect additional demographic items of information such as relationship to household head, marital status, number of dependent children, place of death, as well as medical items of information such as who attended the person at death, causes of death, and medical services provided the individual prior to death.

V.12 *Data collection strategy* Deceased persons are difficult to enumerate in any type of household survey because, quite obviously they are not residents of any household when the survey is conducted. Frequently, the counting rules adopted in the survey link deceased persons to their former households. In that case deaths would be identified by asking a question such as "Did any deaths occur during 1970 among persons normally resident in this household?" Asking the question in this manner would not assure complete reporting of deaths without duplication. For instance, the decedent who had been living alone, for example, would be missed in the survey since he would not be linked to any households. On the other hand, the decedent who had lived in a household which dissolved after he died could be counted in the survey at every household that contained a member of his former household.

Counting Rules

We assured a one-to-one correspondence between infant deaths and housing units in the natality survey by enumerating the infant at the household of his surviving mother. The counting rule we adopted for infants would be appropriate for deaths of young children also only if females in the reproductive ages had low mortality rates. In any event, the appropriateness of this counting rule deteriorates with advancing age of the child since the likelihood increases that the mother would not survive the child.

We shall adopt the following rule for counting non-infant deaths in the mortality survey:

> "Deceased persons are enumerated in the housing units which were their places of residence at the time of death."

This rule assures that there is a one-to-one correspondence between deaths and housing units for the civilian noninstitutional population provided that (1) a negligible number of housing units that were formerly occupied by decedents were destroyed in the interval between the occurrence of death and the date of the survey, and (2) a negligible number of persons were homeless when they died. However, it is noteworthy that deaths in institutional establishments and in the Armed Forces may represent a significant fraction of all deaths in the population. For instance, more than ten percent of the deaths in the United States occur in institutions. Since the rule stated above does not make provision for counting these deaths, the information would have to be obtained from official sources or by conducting a separate mortality survey of the institutional and military populations.

The main difficulty with the counting rule that we have adopted for deaths is one of implementation. The problem arises because the members of the decedent's former household may not be living in his former housing unit on the date the survey is conducted and as a result the decedent is not reported in the survey. To appreciate this problem it is important that we recognize the difference between a housing unit and a household. A *housing unit* is a separate and independent enclosure such as a house or apartment that is occupied or intended for occupancy as living quarters by a group of persons living together or by a person living alone. The person or group of persons residing in the housing unit comprise the *household.* Thus, a housing unit may be occupied by the same or by different households at two points in time. Actually, the household survey is based on a sample of housing units. We refer to the households that are residing in the sample housing units on the survey date as the sample households.

Frequently, housing units that were formerly occupied by decedents do not on the survey date contain the same households that lived there when the deaths occurred. A study conducted in the United States, for example, indicated that about one quarter of the housing units that had been occupied by decedents six months earlier either were vacant or were occupied by households which had moved there

after the deaths occurred. There were two major reasons why the decedents' former households no longer resided in the decedents' former housing units: (1) decedents formerly lived in a one person household, and (2) decedents formerly lived in a household that had moved soon after the deaths occurred. Unfortunately, from the viewpoint of implementing our counting rule, the death of an individual in a household will often lead to the movement or dissolution of the household.

Respondent Rules

To help us cope with the problem of implementing our rule for counting non-infant deaths, we shall adopt the following respondent rules:

1. If the decedent's former household occupies his former housing unit the head and spouse of that household are the eligible respondents.
2. Otherwise, the head or spouse in a neighboring household who knows about the death is the eligible respondent.

Thus, we have two types of eligible respondents depending on whether or not the decedent's former household is living in his former housing unit when the survey is conducted.

Operationally speaking, the respondent rules will work in the following manner with respect to a particular sample housing unit. The household occupying a sample housing unit at the time of the survey, reports deaths that occurred therein during the part of 1970 that it occupied the unit. A neighboring household reports the deaths that occurred in the sample housing unit during the part of 1970 that the sample housing unit was not occupied by the household which lives there at the time of the survey. The procedure for selecting the neighbor's household in the event that the sample housing unit is vacant or is occupied by a household that did not reside there during all of 1970, will be discussed later.

As previously noted the counting rule that we adopted for infant deaths would not be appropriate for deaths at older ages. Otherwise, we would probably have selected it. However, the counting rule that we have adopted for deaths at older ages is applicable to infant deaths. Consequently, we could adopt either rule for infant deaths but not both rules simultaneously if we wish to avoid duplicate reporting of deaths in the survey. We believe that the rule adopted for infant deaths would be far easier to implement than the rule adopted for non-infant deaths. If, however, we had adopted the same counting rule for infant and non-infant deaths we would consider the possibility of asking about infant deaths in the mortality part instead of the natality part of the survey.

V.2 Charting the Logic

The data requirements and the data collection strategy of the mortality survey specify that two kinds of information will be collected for each sample household: (1) items of information to identify non-infant deaths, if any, that would be reported in compliance with the counting rules, and (2) selected items of information for every non-infant death reported.

Provision will be made to expand the Household Form to include items of information needed to identify non-infant deaths reported by the sample household and by the neighbor's household. These items will be contained in separate sections and become Section III, Non-infant Deaths Identified by the Sample Household, and Section IV, Non-infant Deaths Identified by Neighbors, respectively of the Household Form.

The items of information needed for non-infant deaths will appear on the Non-infant Death Form. A separate form will be completed in the survey for every reported non-infant death that occurred in a sample housing unit during 1970.

A flow chart of the major sections of the Household Form showing the relationships of the Household Form to the Birth Form and the Non-infant Death Form is presented in Figure 11.

V.21 *Screening Non-Infant Deaths* There are two sets of items of information that identify noninfant deaths in the sample housing unit. One of these sets of items is completed by the household that lives in the sample housing unit at the date of the survey. The other set is completed by a household that lives in a neighboring housing unit in the event that the sample housing unit is vacant or is occupied by a household that has not resided there during all

Figure 11 Structure of Natality and Mortality Forms

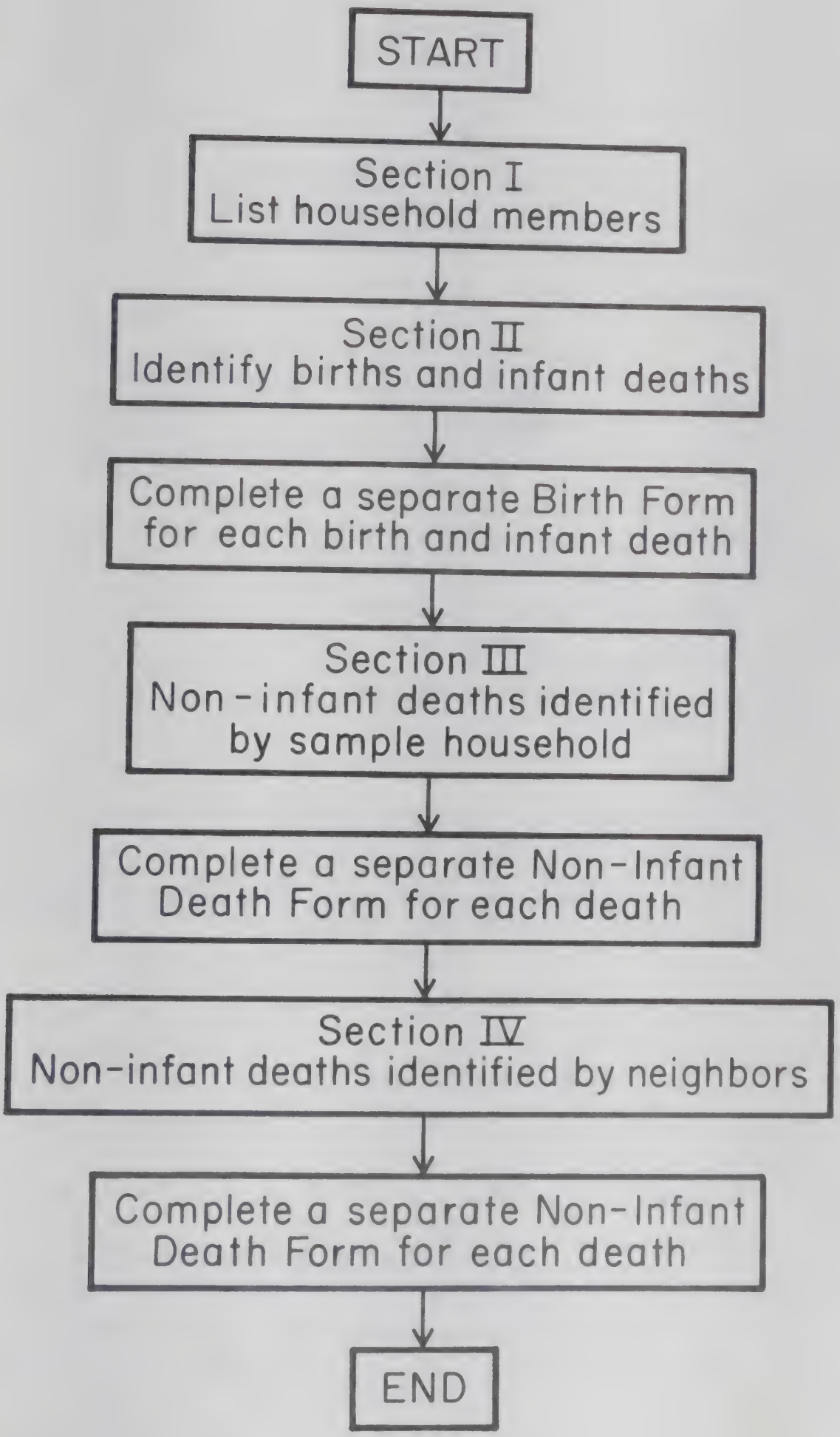
START
Section I
List household members
Section II
Identify births and infant deaths
Complete a separate Birth Form for each birth and infant death
Section III
Non-infant deaths identified by sample household
Complete a separate Non-Infant Death Form for each death
Section IV
Non-infant deaths identified by neighbors
Complete a separate Non-Infant Death Form for each death
END

Figure 12 Flow Chart of Information to Identify Non-Infant Deaths Reported by the Sample Household

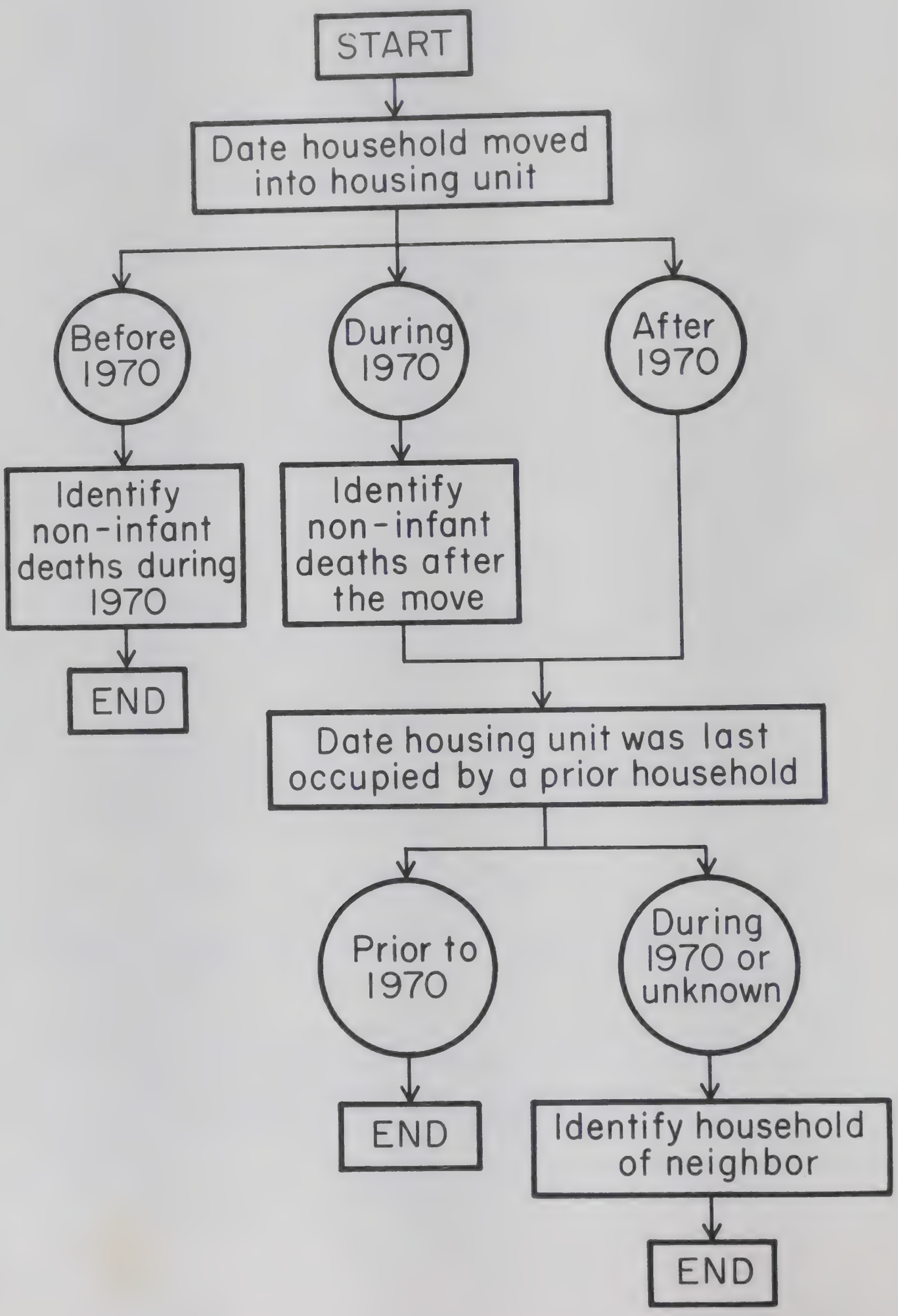

Figure 13 Flow Chart of Information to Identify Non-Infant Deaths Reported by the Neighbor's Household

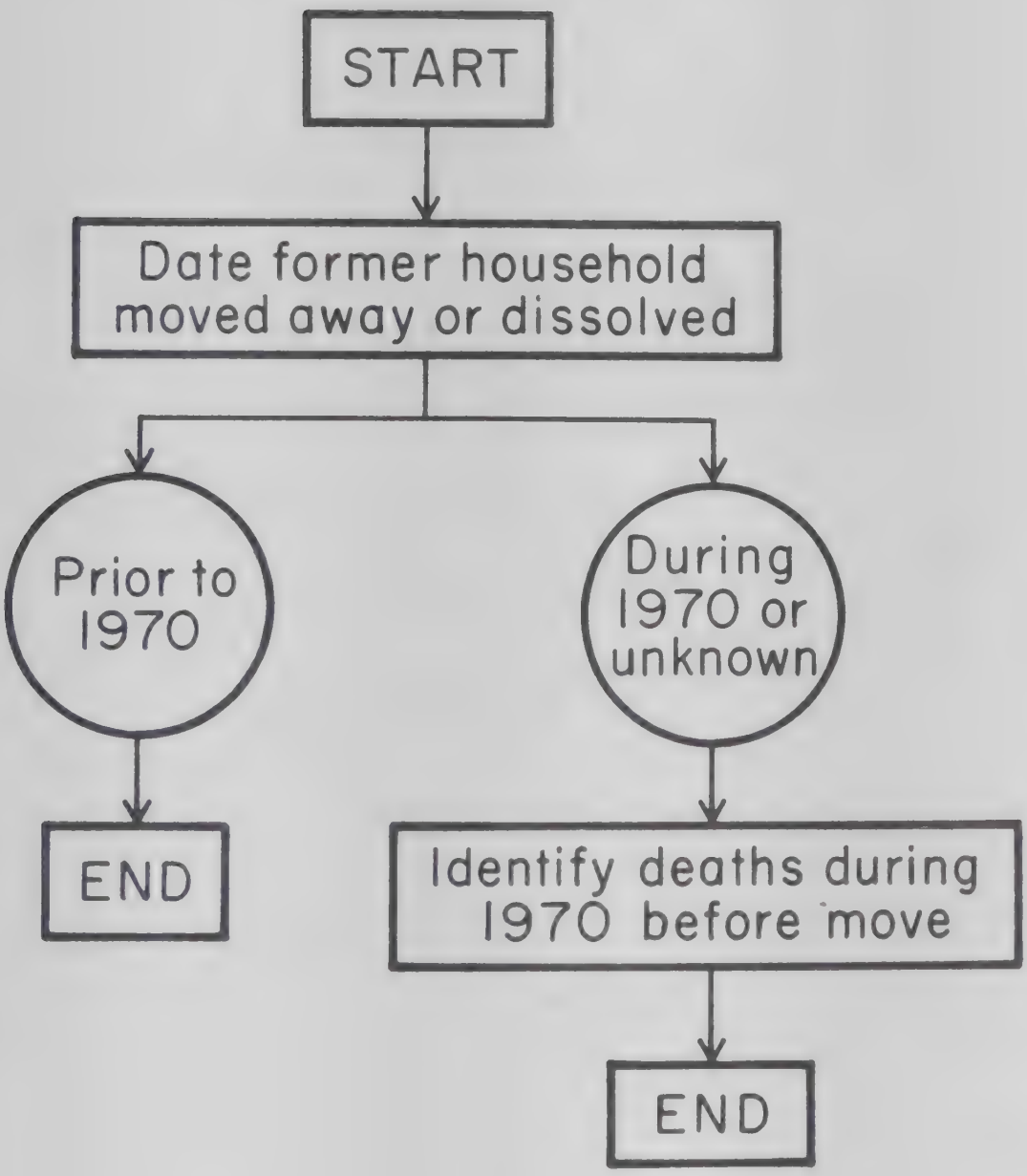

Figure 14 Flow Chart of the Non-Infant Death Form

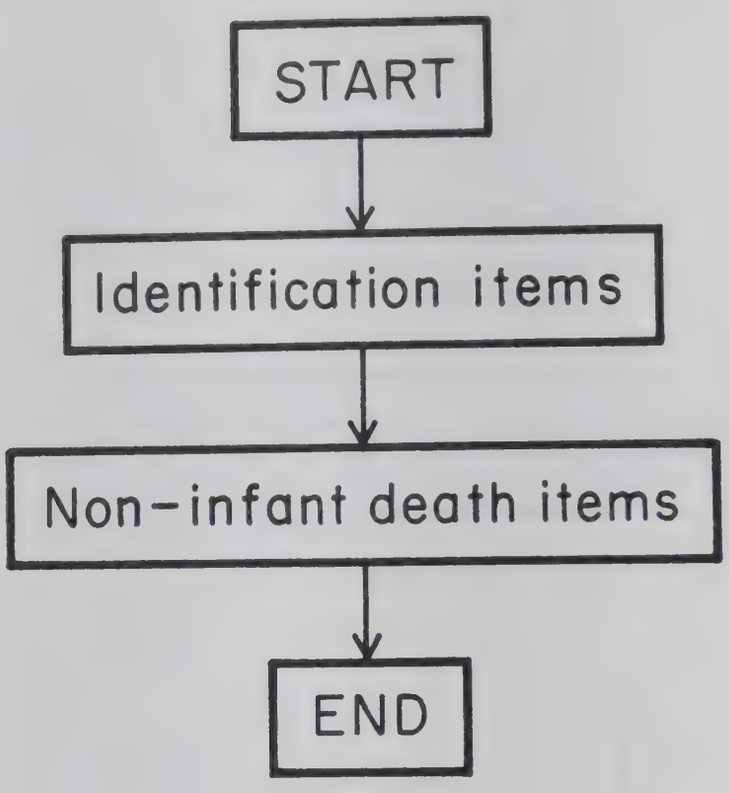

Figure 15 Identification of Non-infant Deaths by the Sample Household

(11) When did your household move into this housing unit?

- ☐ Before 1970 → ASK ITEM (12)
- ☐ During 1970 → SKIP TO ITEM (13)
- ☐ After 1970 → SKIP TO ITEM (16)

(12) Did anyone in your household die during 1970, not counting deaths of babies that you may have already mentioned?

- ☐ NO → END OF INTERVIEW
- ☐ YES → (12.1) What are their names?

_____

COMPLETE A NON-INFANT DEATH FORM FOR EVERY DEATH, AND END THE INTERVIEW

(13) When did your household move here? _____month

(14) Did anyone in your household die during 1970 after you moved here, not counting deaths of babies that you may have already mentioned?

- ☐ NO
- ☐ YES → (14.1) What are their names?

_____

COMPLETE A NON-INFANT DEATH FORM FOR EACH DEATH AND ASK ITEMS (15) AND (16).

(15) Was this housing unit occupied by another household at any time during 1970?

- ☐ NO → END OF INTERVIEW
- ☐ Don't know
- ☐ YES

(16) Who in the nieghborhood would know if anyone died in this housing unit before you moved here?

Name_____ Address_____

- ☐ Don't know

Figure 16 Identification of Non-infant Deaths by Neighbors

(17) When did the people who formerly occupied [READ ADDRESS OF HOUSING UNIT] move away?

- ☐ Before 1970 → END OF INTERVIEW
- ☐ During 1970
- ☐ Don't know

(18) Did any former residents, excluding babies, die during 1970 while living at [READ ADDRESS OF HOUSING UNIT]?

- ☐ Don't know
- ☐ No
- ☐ Yes → What are the names of the persons who died?

COMPLETE A NON-INFANT DEATH FORM FOR EACH DEATH.

Figure 17 Survey Non-infant Death Form

(1) HOUSEHOLD IDENTIFICATION NUMBER_____

(2) NAME OF THE PERSON WHO DIED_____

(3) SEX OF DECEDENT ☐ MALE ☐ FEMALE

(4) How old was (. . . . .) at time of death? _____ years

(5) When was (. . . . .) born? _____ day _____ month _____ year

(6) When did (. . . . .) die? _____ day _____ month _____ year

of 1970. It is important to remember that the neighbor's household would identify the deaths in the sample housing unit and not in its own housing unit.

A flow chart of the items of information completed by the household that resides in the sample housing unit is presented in Figure 12. A screening question determines whether the household moved into the sample housing unit before 1970, during 1970 or after 1970. Households that moved into the housing unit after 1970 do not identify non-infant deaths but identify neighbors who would be likely to know if any deaths had occurred in the housing unit during 1970. Households that moved into the housing unit prior to 1970 identify the deaths that occurred in the housing unit but do not identify neighbors. Households that moved into the housing unit during 1970 identify the deaths that occurred during the part of 1970 that they lived in the housing units and identify neighbors who would be likely to know if any deaths had occurred in the housing units during the earlier part of 1970.

A flow chart of the items of information completed by the neighbor's household is presented in Figure 13. It will be noted that provision is made to collect information from only one neighbor's household. However, the form could be easily expanded to accommodate information collected from additional neighbor's households in the event that the first neighbor's household did not know whether any deaths had occurred in the sample housing unit during 1970.

V.22 *Non-Infant Death Form* The flow chart of the Non-infant Death Form is presented in Figure 14. The identification items include the identity of the sample household and the name of the deceased person. The non-infant death items include the sex and age of the decedent. The data requirements also specify that information is needed with respect to the geographic region that was the decedent's last place of residence. However, since the counting rule we have adopted states that the non-infant death is enumerated in the housing unit that was the decedent's last place of residence, we know that the sample housing unit was the decedent's last place of residence and consequently it is unnecessary to include this item of information on the non-infant death form. (It is of interest to note that the sample housing unit would not necessarily represent the place of residence of an infant death because the infant would be counted in the household where its mother was living at the time of the survey. Consequently, a separate item on the place of residence of the baby at the time of death was included on the Birth Form.)

In this illustrative example only a small number of items of information are collected about non-infant deaths, and it is open to question whether we were justified in designing a separate form to collect this information. For example, we could have made provision to collect these items on the Household Form. However, we noted earlier that our data requirements probably specify fewer than the minimum number of items of information about deaths than would be collected in an actual survey. The decision to design a separate Non-infant Death form becomes increasingly justified as the number of items of information needed for deaths increases.

V.3 Structuring the Questions

We have decided that provision will need to be made to add sections to the Household Form and to design a separate Non-infant Death Form in order to collect the information needed in the Mortality Survey. We have completed the preparation of flow charts for arranging the items of information on the Household Form and on the Survey Non-infant Death Form and we are now ready to create the questions that correspond to the needed items of information.

V.31 *Household Form* Two sections of the Household Form contain items of information needed to identify non-infant deaths; Section III, Identification of Non-infant Deaths by the Sample Household and Section IV, Identification of Noninfant Deaths by the neighbor's household. The proposed questions for Section III and Section IV of the Household Form are presented in Figures 15 and 16 respectively. These questions correspond to the flow charts presented in Figures 12 and 13 respectively.

V.32 *Non-infant Death Form* The Non-infant Death Form (Figure 17) is short and simple

because it collects essentially two items of information, namely sex and age. Items (5) and (6) are included to provide a consistency check on the age reported in item (4). In view of the small number of items, we have suggested earlier that the information about the non-infant deaths might have been collected in a separate section of the Household Form itself rather than on a separate Survey Non-infant Death Form. A possible layout of the items had they been included on the Household Form is shown below:

		A	B	C
(19)	NAME OF DECEDENT			
(20)	Sex			
(21)	How old was . . . at time of death?			
(22)	When was . . . born? (Day, Month, Year)			
(23)	When did . . . die? (Day, Month, Year)			

The name of the person who died in the housing unit during 1970 reported either by the sample household or by the neighbor's household would be listed in item (19), and items (20) - (23) would be obtained for each listed decedent. A separate column (eg., A, B, C) would be completed for each non-infant death.

Earlier we adopted a counting rule for infant deaths that linked them to the households in which their mothers were living on the survey date. We noted that the rule presented a problem whenever the infants' mothers did not survive to the survey date. We indicated that the problem could be overcome if we adopted a supplementary counting rule that linked deaths of infants of deceased mothers to the former residences of the mothers. Listed below are the additional items that we would have to add to the Non-infant Death Form if we decided to adopt this supplementary counting rule for infants.

(7) Was (_____) A FEMALE IN THE AGE GROUP 15 TO 50?
☐ YES
☐ NO END

(8) Did (_____) have a baby that died during 1970?
☐ YES → (8.1) What were the names of the babies that died?
☐ NO

COMPLETE A BIRTH FORM FOR EACH INFANT NAMED IN ITEMS (8.1).

It should be noted that the final instruction to the interviewer results in a separate Birth Form being completed for each infant that died during 1970 whose mother also died during 1970. In the event that this survey of population change was not conducted at the beginning of 1971, provision would also need to be made to identify deaths of infants during 1970 to mothers who died after 1970 but before the survey was conducted.

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